

FLIGHT

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AND AIRSHIPS

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EDITORIAL COMMENT



SIR PHILIP SASSOON'S announcement that Lord Londonderry has decided to renew the subsidies to the approved flying clubs on terms which will make it possible for each club to earn more in a year than has hitherto been found possible, was the outstanding feature of the debate on the Air Estimates.

The Under-Secretary added that though payments for new licences would be on a more generous scale than heretofore, the total which each club could earn in one year would be reduced from £2,000

The Flying Clubs Saved to a lower figure. As no club has yet been able to earn more than a fraction of that sum, the reduction of the permissible total does not seem to be of vital importance.

The main point is that the clubs should have more money in their pockets, rather than that the amount which they might have earned, but did not, was either large or small. The new scheme is to operate for five years, provided that the House of Commons will vote the money each year. There should be little doubt about that, at least during the lifetime of the present Parliament. During the debate on the Estimates, member after member raised his voice in appeals for the flying clubs, and not even the Socialists found reason to condemn this form of activity and of Government expenditure. We await the full details of the new scheme with the greatest interest.

Apart from this one feature, the debate on the Estimates was a very dull affair. It had its brighter moments, and there was merit in the treatment of the Amendment which dealt with the subject of airships. The case for airships was put without extravagance by Messrs. Wellwood Johnston and Wells, and it elicited a clear statement of the Government's attitude from Sir Philip Sassoon. All thoughtful observers, it appears, are impressed by the success of the *Graf Zeppelin* and of other airships, and the Government believes that if they are properly developed they may confer great benefits on mankind in general and the British Empire in particular. It was made clear that the disaster to R 101 was not the cause of the Government's decision to close down

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1932
- Mar. 23. "High-Speed Flying," Lecture by Sqdn.-Ldr. A. H. Orlebar, before R.U.S.I.
- Mar. 24-28. London Gliding Club's Meeting at Dunstable.
- Mar. 30. R.Ae.C. Annual General Meeting.
- Apr. 1. Entries close at ordinary fees for King's Cup Race.
- Apr. 1. Opening of Greek Aero Show, Athens.
- Apr. 2. Rugby: Army v. R.A.F., at Twickenham.
- Apr. 2-10. National Aircraft Show, Detroit, U.S.A.
- Apr. 7. "Wing Construction," Lecture by H. J. Stieger, before R.Ae.S.
- Apr. 16. T.M.A.C. Dance at Suffolk Galleries, Suffolk St., S.W.1.
- Apr. 13. "The North-West Frontier of India," Lecture by Maj.-Gen. S. F. Muspratt, before R.U.S.I.
- Apr. 14. "Aero Engine Accessories," Lecture by W. L. Taylor, before R.Ae.S.
- Apr. 21. "Air Port Development," Lecture by N. Norman, before R.Ae.S.
- Apr. 23. No. 45 Sqdn. R.A.F. Reunion Dinner at Crown and Cushion Rest, London Wall.
- May 1. Entries close at double fees for King's Cup Race.
- May 7. Heston Spring Cruise begins.
- May 14. Coventry Ae.C. Air Pageant.
- May 14-15. Skegness Air Pageant.
- May 16. Northampton Ae.C. Flying Meeting.
- May 18. Household Brigade Flying Club Meeting, Heston.
- May 21. Morning Post Race, Heston.
- May 21-23. Scottish Flying Club Display, Moorpark, Renfrew.
- May 22. Husbands Bosworth Flying Meeting.
- May 22-30. Conference of Transoceanic Aviators at Rome.
- May 28. London-Newcastle Air Race for "Newcastle Evening World" Trophy.
- May 28. Brooklands Meeting.
- June 4. Bristol Airport Summer Flying Meeting.
- June 4. Cardiff Flying Meeting.
- June 4. Leicester Ae.C. Flying Display and Motor Gymkhana at Ratcliffe Aerodrome.
- June 5. Reading Ae.C. At Home, Woodley Aerodrome.
- June 11. Leicester Ae.C. Meeting, Desford.
- June 18. Hull Air Display.
- June 21-28. Blackpool Air Pageant, Stanley Park.
- June 25. R.A.F. Display, Hendon.
- June 25-26. International Tourist Rally, Boulogne.
- July 2. Opening of Portsmouth Municipal Aerodrome.

airship activities. "I believe," said Sir Philip, "that the case for airships has neither been proved nor disproved. I am very much against those people who say that the disaster to R 101 is a reason for going back on former policy or for considering that, because of that disaster, there is no future for airships." It was sheer lack of money which had dictated our latest decision.

We got some sound horse-sense also from Mr. Lovat-Fraser, a National Labour member, who asked for research in the direction of abolishing the noise made by aircraft, not for the benefit of those in the cabin, but for those on the earth below. Another Labour member, Mr. Batey, was not altogether foolish when he pointed out that our supplies of petrol are one of our vulnerable points in time of war; though his suggestion that we should try to extract all the oil and petrol which we need from coal may not have been very helpful. Capt. Balfour obscured one good point in a mass of fury. We agree with him that a fast air-mail service is one of our chief needs, and that the attempt to combine mail and passenger carriage is not the best policy. Still, until we have a special mail-plane, and one is now under way, the charge has an academic rather than a practical value. Fury, in speech as in writing, has the one merit of waking up the sleepers and affording them some amusement. The debate was growing monstrous dull until the House encountered what Mr. Rhys Davies called "a storm over the Isle of Thanet." Capt. Balfour did not do much harm to the privileged position of Imperial Airways, but he evoked a little gentle satire in Sir Philip Sassoon's reply; and for this awaking of the humorous element he deserves thanks.

Capt. Knatchbull made one interesting point. He and Mr. Simmonds voiced the woes of the aircraft industry, and with their complaint we have the deepest sympathy. Capt. Knatchbull mentioned the inadvisability of standardising too much on service types. If we adopted only two types of single-seater, there were only two designing staffs kept busy improving those types; whereas if we had several types more firms would be kept busy. For economy and for efficiency it may be much the best that the Royal Air Force should have as few types as possible at the same time; but if our aircraft firms cannot be kept in vigorous life, both efficiency and economy will suffer in the end.

Of course, the House had to listen to the usual fatuous pacifist pleadings to the effect that it is very wrong to have any air armaments at all. It is used to that, and it bore it as something inevitable. It is strange that many people find so much difficulty in distinguishing between a peaceful spirit and a pacifist spirit. Anyone who fought in the late war is inevitably intensely peaceful. He never wants another war, either for himself or for his descendants. But the pacifist hopes to prevent war by discarding the means of protecting ourselves. He might as well hope to abolish crime by disbanding the police force.

Sqd. Ldr. the Marquess of Douglas and Clydesdale, in speaking up for the Auxiliary Air Force, in which he commands No. 602 (City of Glasgow) (Bomber) Squadron, made a curious remark. He quoted the fact that we are still short by 10 squad-

rons of our programme of 52 squadrons for home defence, and suggested "that the Air Ministry should change its policy and establish, in place of these 10 regular squadrons . . . at least 10 Auxiliary Air Force squadrons." Why should the C.O. of No. 602 B.S. assume that the 10 remaining squadrons are to be regulars, and why should the formation of more A.A.F. squadrons mark a change of Air Ministry policy? Surely Lord Clydesdale must know that, of the 42 home defence squadrons which we possess, 13 are non-regular, *i.e.*, 5 cadre and 8 Auxiliary squadrons. That fact was clearly stated in the Air Minister's memorandum which accompanied the Estimates. The probability is that when the remaining 10 squadrons come to be formed, some of them will be either cadre or A.A.F. squadrons. At the moment the programme is to remain uncompleted, and when the formation of new squadrons is resumed, we certainly hope that some will be regular and some will be A.A.F. The suggestion that all 10 should be A.A.F. units is not one to be approved. The Noble Lord also urged that some A.A.F. squadrons should be equipped with flying boats. On the whole we like this suggestion, though flying-boat pilots and airmen have more to learn and need more practice than is needed in a bomber squadron. In the regular Air Force, pilots are changed about from one squadron to another, and it is known that it takes a pilot who is quite experienced in landplanes some months of continuous work and practice before he becomes a really efficient boat pilot. When he has learnt the job thoroughly, he is probably sent back to landplanes. That would not happen in an A.A.F. flying-boat squadron. It would be located on the coast, where good watermen and sailors could be recruited, and they would stay in the one squadron for the whole of their service; but such a squadron would probably be slower than a bomber squadron in attaining high proficiency.

Brig. Gen. Spears had one more tilt at the R.A.F. armoured cars in Palestine and Transjordan. We hope that it was a final one, and that Gen. Spears is now satisfied. The House, we should imagine, must be getting as bored by his repeated remarks on this subject as we are ourselves. Why cannot he vary the proceedings by demanding that the Royal Marines should be placed under the War Office? It would be just as sensible and just as useful an outcry. The reform which is really needed, as we pointed out a few weeks ago, is for the searchlights and anti-aircraft guns which are an integral part of air defence to be taken away from the War Office and placed directly under the Air Ministry. Then, if Gen. Spears should think fit to urge that the School of Army Co-operation at Old Sarum and the five Army Co-operation squadrons in this country should be paid for out of the Army Estimates, as the Fleet Air Arm is paid for out of the Navy Estimates, and as the R.A.F. squadrons in India are paid for by India, we shall raise no objection. Air Defence is the especial business of the Royal Air Force, and divided control is one of the best ways to achieve defeat in war. Those guns and those searchlights must, sooner or later, be handed over to the Royal Air Force.





D. H. "Fox Moth"

A New Economical 4-5 Seater with 120-h.p. Gipsy III Engine

CARRYING pilot and, for short flights, four passengers on a single "Gipsy III" engine of 120 h.p. must be regarded as very economical flying indeed.

The new de Havilland "Fox Moth" does this, although normally it is intended for pilot and three passengers, with which load the machine carries fuel for a flight of some 360 miles. Add to this that the new machine will be marketed at less than £1,000, and it will be seen that the day of cheap flying is not as far away as many appear to think.

The "Fox Moth" owes its inception very largely to Mr. Hagg, Chief Designer of the de Havilland Aircraft Co., Ltd., whose few spare moments are often spent in yachting. Getting to and from the coast quickly, and *en famille*, has been a very real problem, but with the "Fox Moth" it disappears. Mr. Hagg is himself a pilot, and the little cabin has accommodation for the rest of the Hagg family and the considerable quantities of luggage, etc., which the week-end cruiser needs to take with him. If the machine so admirably meets the requirements of its designer it will meet those of numerous other family men, for whom the "Puss Moth" just falls short of the desired seating capacity.

As a joy riding machine the "Fox Moth" should become extremely popular because, by carrying a smaller quantity of fuel than standard, it will take up four paying passengers. The accommodation is not, in that case, luxurious. In fact, it is, as far as the front seats are concerned, rather cramped, but as joy ride flights are usually of very short duration, this should not be really important, and the economy of the machine is such that its operation should net a very substantial profit.

Yet another form in which the "Fox Moth" will have much to recommend it is as the private machine of the man or woman who employs a professional pilot. If real comfort is desired, it can be provided by having but two seats in the cabin, these of the armchair variety, and so placed as to give very ample leg room.

With its cabin stripped, the "Fox Moth" should be a most economical carrier of freight and mails on routes where the volume of traffic is not large enough to justify the operation of a larger and more powerful machine, and finally with three seats and the full amount of fuel the machine should be well suited for air taxi work.

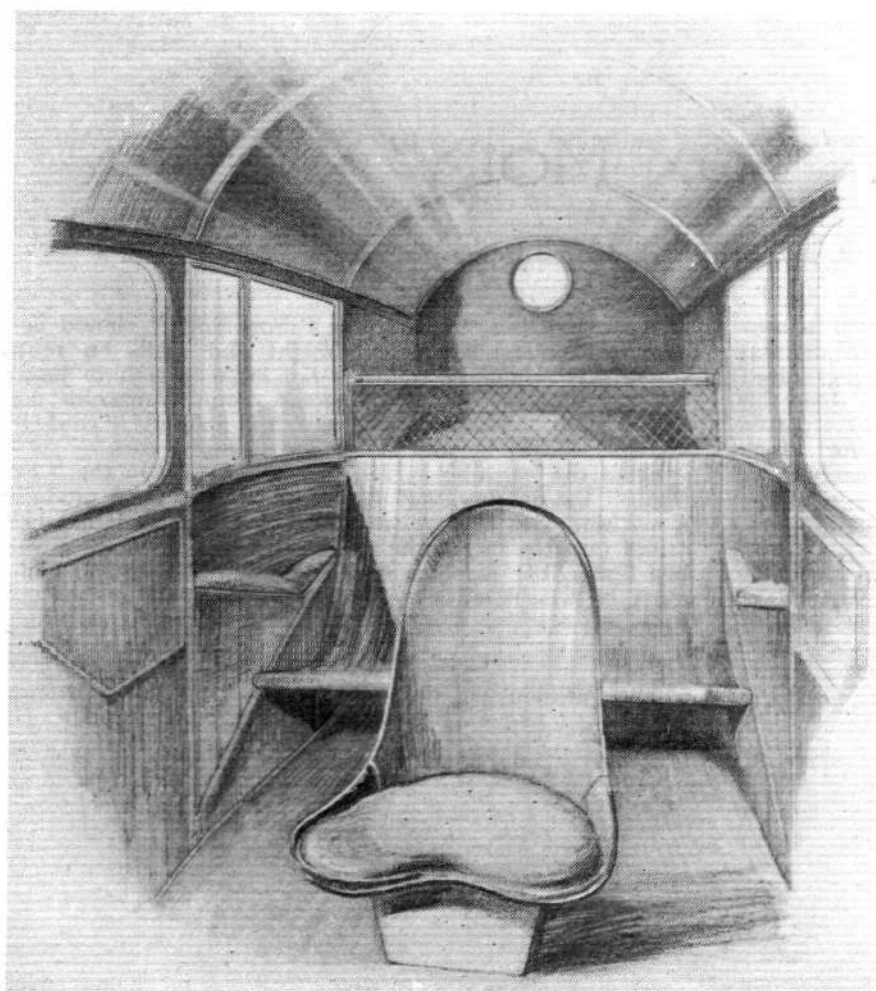
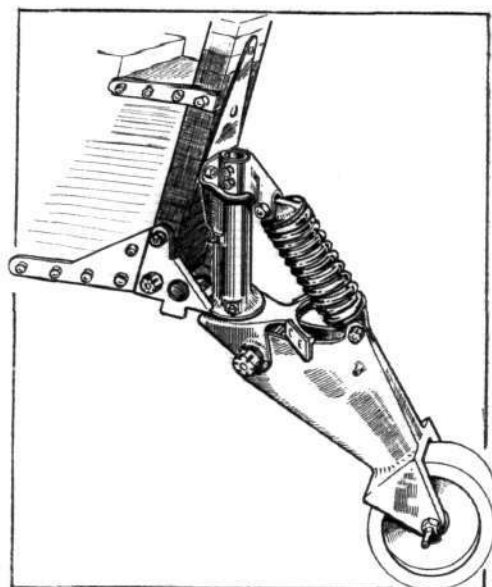
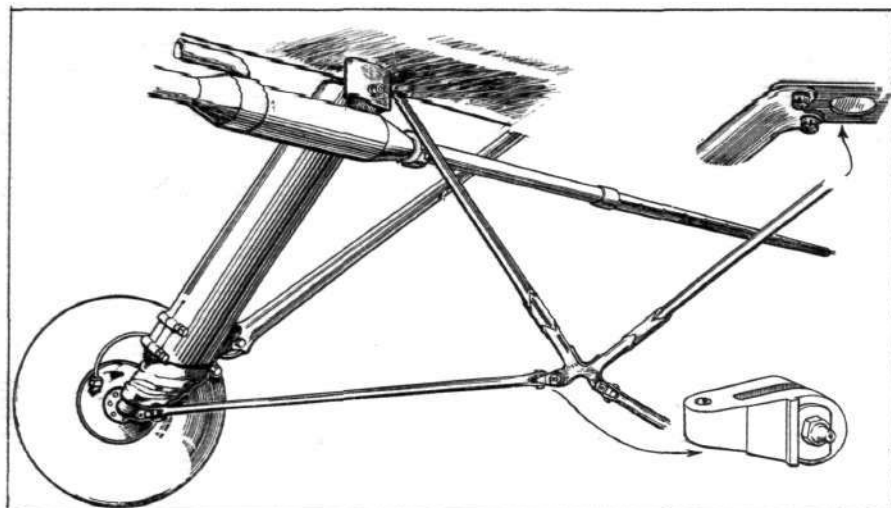
From the foregoing it will be realised that in the "Fox Moth" the de Havilland Aircraft Company have produced a machine with a great variety of uses, and as it has been found possible to get the production cost down to a very low figure, the machine can be marketed at £995, which must be considered very good value indeed, in whatever form the machine is used.

Getting the Cost Down

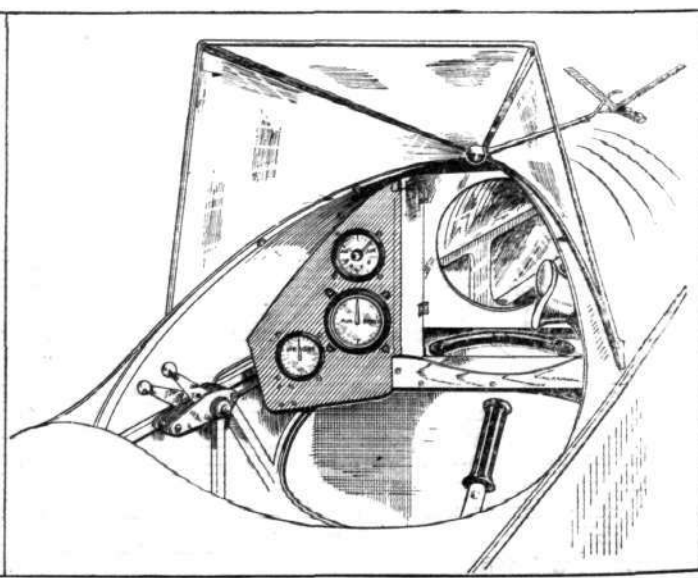
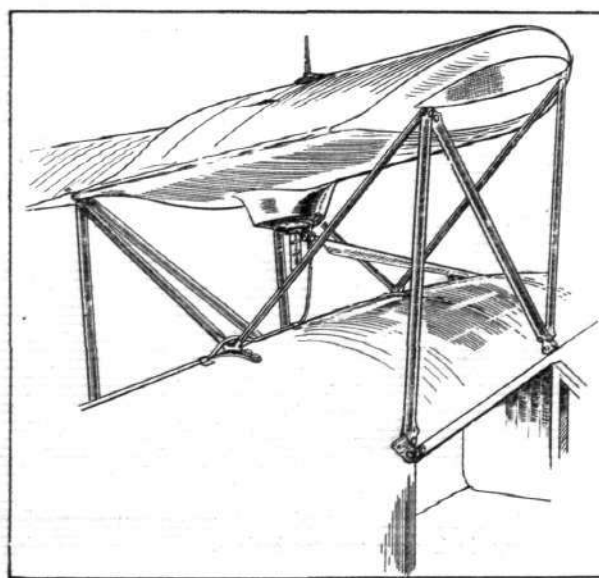
The question will naturally be asked: How has it been

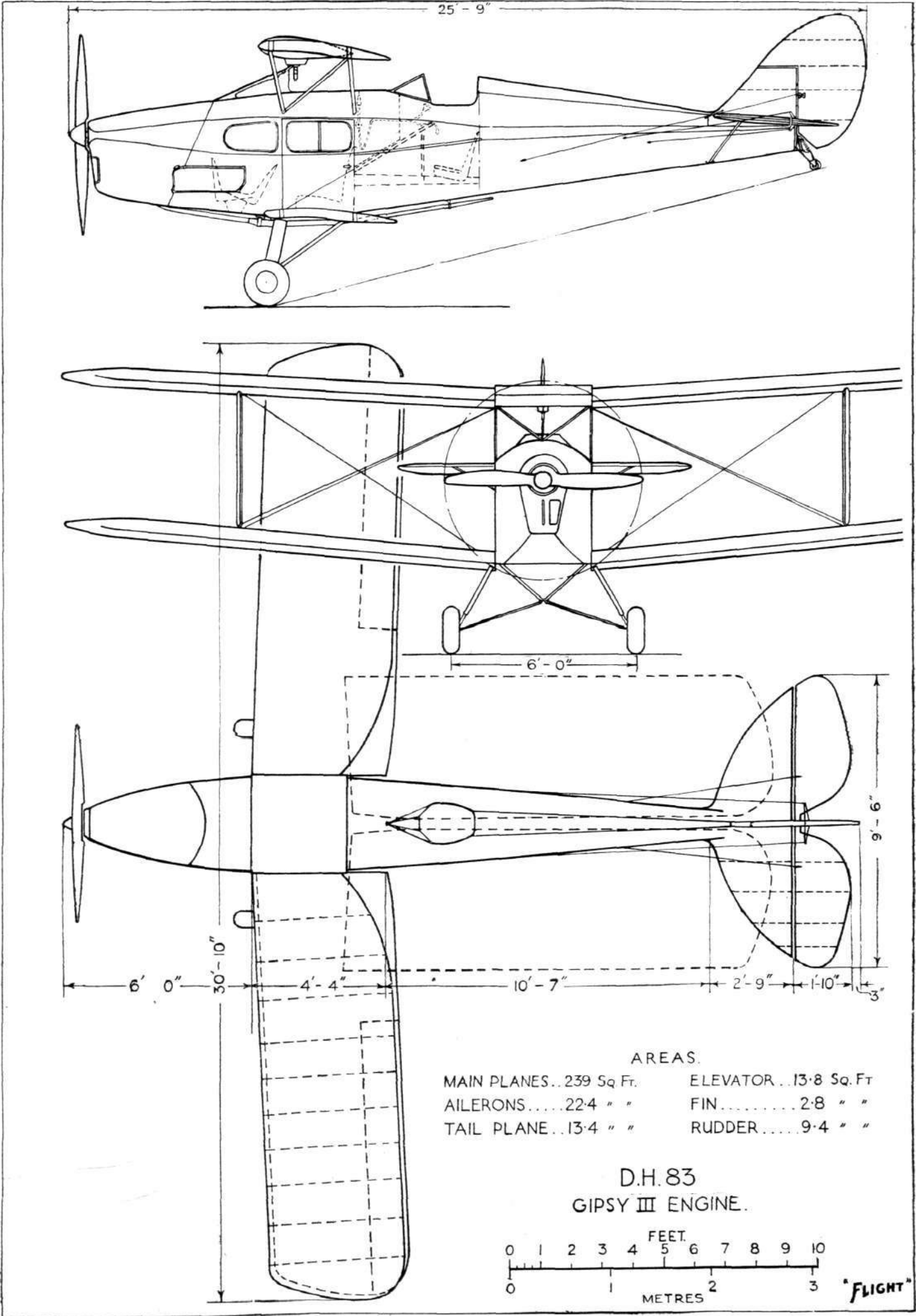


TWO VIEWS OF THE "FOX MOTH": In spite of cabin accommodation for three passengers, the fuselage is by no means bulky. (FLIGHT Photos.)



SOME DETAILS OF THE DE HAVILLAND "FOX MOTH": Above, on the left, the undercarriage. The wheels are carried on stub axles, and the bracing struts have universal joints. On the right the castoring tail wheel. The cabin arrangement is shown on the left. Of the lower sketches that on the left shows the centre-section petrol tank and its supporting struts which form a letter M in end view and an N in side view. The supply pipe to the engine runs above the cabin top. On the right is a view into the pilot's cockpit. The circular window communicates with the cabin. The wind screen consists of three triangles, and gives a marked absence of draught in the cockpit. (FLIGHT Sketches.)





THE DE HAVILLAND "FOX MOTH": General Arrangement Drawings, to Scale.

possible to reduce the price to less than £1,000? The answer is by using wood construction, and by incorporating as many parts as possible from existing de Havilland types. For example, the wings are, with the exception of minor changes in the roots of the lower plane, the standard wings of the "Tiger Moth." The tail organs are standard "Puss Moth" and "Gipsy Moth." The whole engine unit is identical with that of the "Puss Moth" and "Tiger Moth." Practically the only new large component is the fuselage, and that is of the all-wood type, with flat sides and bottom, covered with plywood.

The "Fox Moth" is the D.H.83 of the de Havilland series, and is a biplane with staggered and back-swept wings. The sweep-back is slightly less than in the "Tiger Moth," and the span is a little greater as the fuselage and top centre-section are wider.

The pilot is placed aft of the wings, and as the top of the fuselage is narrow in front and slopes down to the inverted engine, the view is good.

The cabin is arranged, in the first machine, with a deck chair seat for two across the back, and a single swivelling "bucket" type of seat in front. The passenger can sit facing aft or he can face forward, but his face is then rather close to the engine bulkhead, and the leg room is somewhat restricted.

There is a door in each side of the cabin, and the covering is curved outward to give extra elbow room for the passengers. The curvature extends to the windows, and with the front windows open there is a strong draught clearing the cabin, while with the rear windows open the air is extracted quite gently and without undue draught. Due to the effective silencer and the padding of the cabin, the noise is by no means excessive, and conversation can be carried on without shouting. A telephone is provided by means of which the passengers can converse with the pilot. This telephone is of the single-hand type, with ear-piece and mouthpiece mounted together.

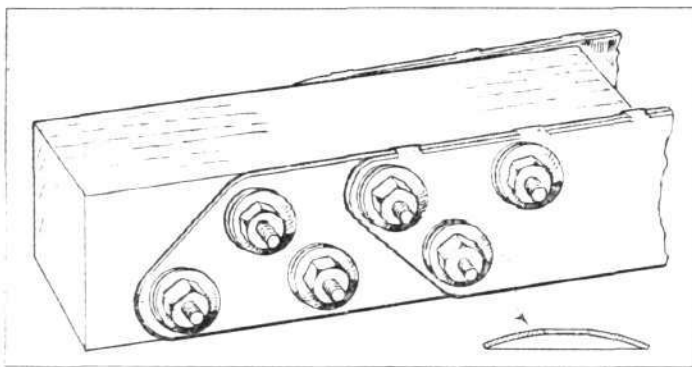
The hammock seat in the first machine could be improved by padding the front cross bar of it, but this and other minor points will doubtless be attended to in the production machines.

In the air the "Fox Moth" is much like the "Tiger Moth" in its handling, and pilots appear to be agreed on the pleasant flying qualities of that machine. The glide is flat as a result of the clean design, but the machine can readily be sideslipped if there is risk of overshooting.

From the structural point of view there is little to call for comment in the "Fox Moth." The undercarriage is of the divided type, and the wheels are carried on stub axles, while universal joints are provided everywhere, so that the diagonal bracing struts take no bending loads and are consequently kept very slender and of low air drag. The telescopic struts are substantial, but have to be so in

any case, and altogether the undercarriage seems to be a very practical piece of engineering. Bendix wheel brakes are fitted, and a castoring tail wheel enables full use to be made of the individual operation of the brakes, the machine swinging around "on a saucer" when manoeuvring on the ground.

The wings, as already mentioned, are the standard "Tiger Moth" wings, with the exception that the lower plane roots have been slightly altered to permit of folding. The lower wing roots are slightly drawn up at the trailing edge, thus reducing interference and eddy making. The



TAKING CARE OF WOOD SHRINKAGE : Dished steel washers under all nuts ensure that pressure is maintained even when the wood under the plates has shrunk considerably. (FLIGHT Sketch.)

top centre-section contains the streamline petrol tank, and affords gravity feed to the engine.

The plywood covered fuselage of the first machine is of normal construction, but in subsequent machines extensive use will be made of dished steel washers. Experiments have indicated that by inserting these between the nuts and the metal plates, a shrinkage of the wood does not result in any slackness which might reduce the strength of the structure. The plywood is specially protected. First a fabric covering is put on it with cellulose dope, and then an external coat of dope is applied, so that moisture cannot penetrate to the wood.

The tare weight of the "Fox Moth" is about 1,050 lb., and as the gross weight is 2,050 lb. the normal tankage of 25 gallons gives a disposable load of 790 lb. for pilot, passengers and luggage. The maximum speed is approximately 110 m.p.h., and the cruising speed 90-95 m.p.h.



FOLDING WINGS : Although making use of standard "Tiger Moth" wings, the main planes of the "Fox Moth" are arranged to fold. (FLIGHT Photo.)

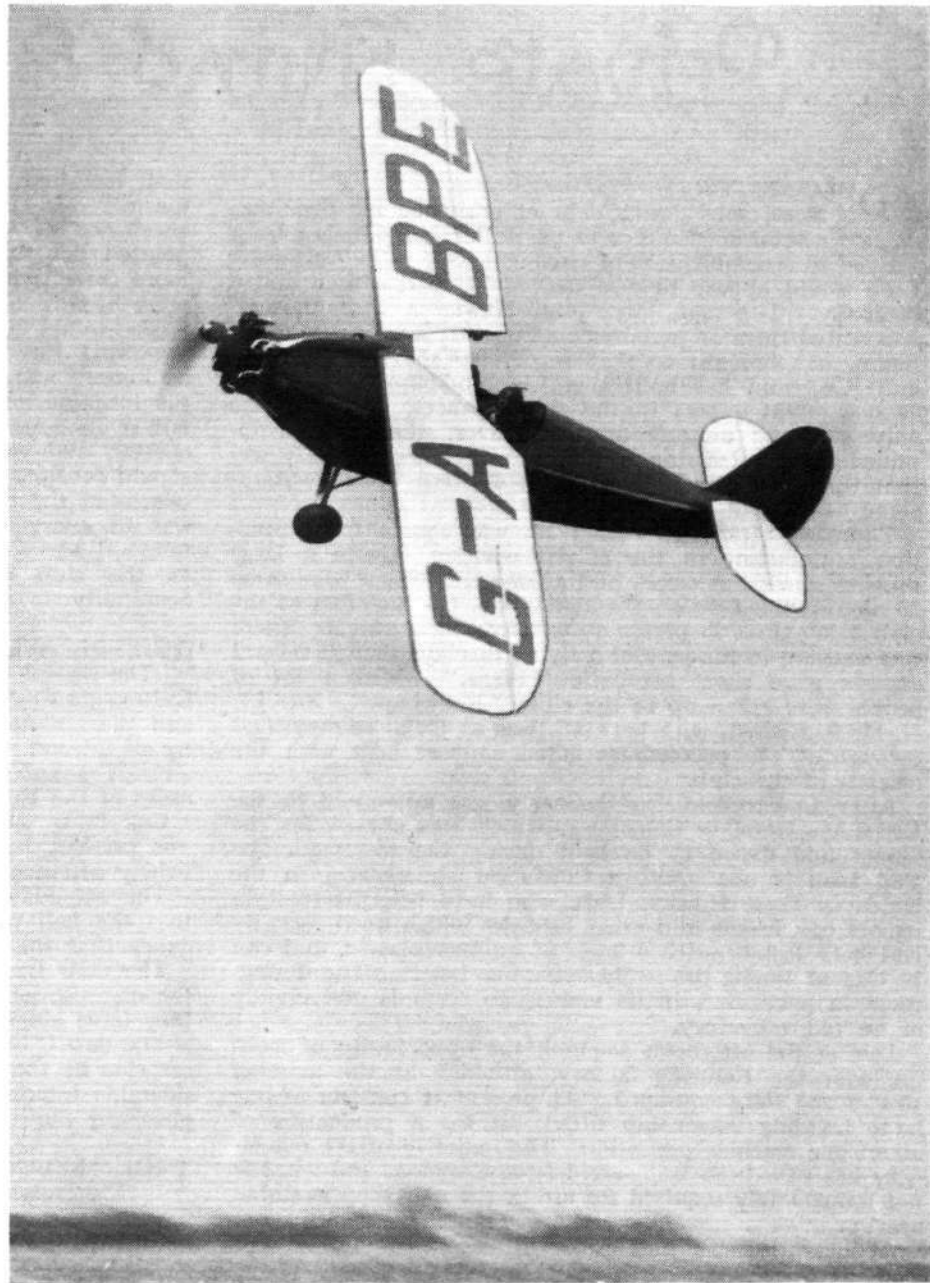
"SWIFT" LY ACROSS THE ANDES

THE Pobjoy-engined Comper "Swift" goes from triumph to triumph. First Mr. C. A. Butler flew one from England to Australia in record time, and on reaching Australia he continued his tour, piling up the truly impressive mileage of 22,947 miles in eight weeks. And now comes news that Mr. C. Taylor, of "Aerofotos," Buenos Aires, who is representative in Argentina of the Comper "Swift," has flown across the Andes in his machine.

At the moment but meagre details of the flight are available, but it appears that Mr. Taylor left Mendoza in Argentina and landed near Valparaiso, Chile, 1 hr. 50 min. later, having flown over the Andes mountains at a height of approximately 18,000 ft.

The Comper Aircraft Co. have received from Mr. Taylor a cablegram which reads as follows: "Crossed Andes safely this morning at 18,000 ft. This constitutes record for lightest plane to cross the Andes. Time employed 1 hr. 50 min."

A gratifying feature of the flight is that it was accomplished by all-British material, not only the "Swift" monoplane and the Pobjoy "R" engine being manufactured at Hooton, Cheshire, but all the various accessories, such as the K.L.G. plugs and the B.T.H. magnetos being British, while the dope with which the fabric is impregnated was Cellon.



THE COMPER "SWIFT" (POBJOY ENGINE): These photographs show the machine which belongs to Mr. Selfridge. That used by Mr. Taylor in his flight was similar. The installation of the Pobjoy is shown on the left, while the photograph on the right shows that although the machine is diminutive, the pilot can take with him a full-size suit case when he goes touring. (FLIGHT Photos.)

Private Flying & Gliding

COLCHESTER

Most clubs owe a debt of gratitude for their successful start either to particular individuals or else to a combination of circumstances. The Colchester Club would appear to owe their debt to one man and a company. The man, Mr. John Howie, a Scots farmer, has rented them an aerodrome at what is merely a nominal figure, has brought to that aerodrome the Redwing Aircraft Co., and has built them a club-house. Naturally, as one might expect in the circumstances, the club uses only Redwing aircraft and, moreover, these are maintained in the Redwing works, so altogether one may say that the Colchester branch of the Eastern Counties Aeroplane Club is in "clover."

Thursday afternoon, March 10, was chosen for a function tantamount to the official opening. Quite a large number of visitors came, and at one time there were some 25 aircraft lined up on the aerodrome, the directors of the club being there in person to welcome their guests. There was nothing in the way of a flying display, though several experts gave short aerobatic "turns," whilst a lot of people were taken up in the club "Redwings." Flt. Lt. N. M. S. Russell, with his staff, was as jovial as ever, and throughout the proceedings acted as part host with the officials of the club.

After an excellent tea the party was adjourned to the Red Lion Hotel in Colchester, which was chosen for the dinner and dance to be held during the evening. The Red Lion is now quite a Colchester show-place, in the hands of Trust Houses, Ltd., who have brought to light its old oak beams and other beauties which until recently had been lost beneath a layer of modern plaster, and can be classed among the really attractive hotels. The dining-room in particular, in its new garb, reminds one vividly of an old refectory.

During the afternoon we took the opportunity of looking over the Redwing factory, although at the moment this is not fully equipped. At present it consists of one large building reasonably fitted out for a production of about one machine per week. The majority of the machinery has now been transferred from Croydon, and what is not immediately required for use in the new shop is stored nearby.

About the dinner and dance little can be said, except that everyone appeared to enjoy themselves fully. At the dinner the Mayor proposed the toast of Mr. C. W. A. Scott, a native of the ancient town, who was the chief guest of the evening, the dinner being really in the nature of a send-off to him on a new record flight to Australia which he shortly contemplates. In an encouraging speech the Mayor said that not only would the eyes of Colchester and Mersea, but the eyes of the whole world would be watching him; therefore, one and all would hope that he would create a new record. He felt that in extending to this magnificent pilot of theirs God-speed on his journey he was voicing the feelings of everybody.

Mr. Scott, in his reply, wondered very much whether those present realised what the Mayor's speech meant, for its wording put on him a very vast responsibility. "After all," he averred, "I am only trying to regain my own record, and it is largely a personal matter, but it makes it somewhat terrible when I realise that, as the Mayor has put it, everyone's eyes will be upon me, for nowadays we know that British aircraft and engines have been brought to such a pitch of efficiency that the chance of either of them letting me down is very remote indeed. It therefore means that it is almost entirely a question of my own endurance, and if I 'boob' I

shall feel that it is me personally who has let everyone down." Mr. Scott then enlarged a little more on the excellence of British aircraft and aircraft engines, and pointed out that at the beginning of such a flight, or, more correctly, during earlier flights, the thoughts of the pilot had been focussed almost entirely on whether his engine would fail him; now, however, the tables had been somewhat turned, and a pilot's chief thought is whether he himself will fail or be able to rise to the capability of the machine and engine. In conclusion, he said that he felt it an honour to be associated with the name of Colchester, and voiced a plea that the municipal authorities should consider taking an interest (probably greatly to the benefit of the town) in the Blue Barns Aerodrome, which was in every way excellent. The dancing itself which followed was voted excellent, and one and all felt indebted to the club and the Redwing Aircraft Co. for their hospitality.

BRISTOL AVIATION BALL

The Bristol Aviation Ball, held at the Grand Spa Hotel, Clifton, on Friday, March 11, was organised by the Bristol and Wessex Aeroplane Club, and was strongly supported by all interested in aviation in the West of England, from aircraft manufacturers to the local contingent of the Comrades of the Royal Air Forces.

Col. F. C. Shelmerdine, the Director of Civil Aviation, was present, having flown to the Bristol Airport on the Friday afternoon, returning to London the next day.

The attendance was 230, and it was generally agreed that the ball was the most pleasant and most successful dance that the club has yet organised.

The club Ladies' Committee, who were responsible for the organisation, are fully entitled to the congratulations they have already received.

The new "Bristol Pegasus" engine, kindly lent for the occasion by the Bristol Aeroplane Co., Ltd., attracted considerable interest, and assisted to a great extent in emphasising the aeronautical atmosphere of the dance.

THE "MORNING POST" RACE

The cross-country race for the *Morning Post* Trophy, the preliminary details of which we announced in *FLIGHT* for February 26, has now been finally organised. As was pointed out at that time, its primary object was to be a test of skill in air pilotage as opposed to a pure speed race, it thereby being hoped to encourage a high standard of cross-country flying and to emphasise in particular the utility side of light aeroplane flying. The race will take place on May 21 and is being organised by Airwork, Ltd., for the *Morning Post*. It is to be noted that while the aircraft will be handicapped on estimated performance,



The new Brooklands Aero Club House which is now habitable and nearly completely furnished. It should make a good grand stand during the King's Cup Race.

inexperienced pilots will also be able to claim a substantial time allowance according to the hours they have flown. Both these allowances will be adjusted at the start and the pilot will at his starting time be handed a sealed envelope containing a map and the details of the places he must find and visit. The total length of the course will be about 500 miles with intermediate controls arranged so that large fuel capacity will be unnecessary. The last moment for entering (at double fee) is 5 p.m. on May 7.

RULES.

1.—The race shall be known as "The Morning Post Cross-Country Air Race."

2.—The race shall be held under the Competition Rules of the Royal Aero Club and the regulations of the Federation Aéronautique Internationale, together with the Supplementary Regulations set out hereunder, and such further Supplementary Regulations as may hereafter be issued.

3.—The race shall be held on May 21, 1932, commencing and finishing at Heston Airport. If it is necessary to postpone the race for any reason, it will take place as soon afterwards as the officials shall deem practicable.

4.—Competitors must register their entry in the Competitors' Register of the Royal Aero Club, *vide* Rules 29-32 of that Club.

5.—The race will be a handicap cross-country race, the aircraft being handicapped for the complete course according to estimated performance. In addition, competitors who at 5 p.m. on April 30, 1932, shall have had less than 250 hours' piloting experience may claim a time allowance of five minutes; those with less than 100 hours' experience, an allowance of ten minutes; and those with less than 50 hours' experience, an allowance of 15 minutes respectively. The itinerary will not be divulged to competitors until they are due to start. When this time arrives, each competitor will be handed a ten-mile to one inch Civil Air Edition Map of Great Britain, on which will be marked the various places to which he has to go, but beyond this no other additional mark or lines will appear on the map. At the same time he will be given a slip on which will be recorded the order in which the places marked on the map are to be visited up to the first control, together with a copy of the daily weather report as broadcast by the Automobile Association from Heston Airport. Competitors will have to find the bearings and work out the course themselves, no outside assistance being allowed. Tables only will be provided on which to spread out the map. No restrictions will be imposed as to the use of other maps, it being left free to each competitor to use and mark whatever map is desired. The area covered by the race will be included within Sheet 3 of the Civil Air Edition 10-mile map of Great Britain. Competitors will be at liberty to start as soon as they have received the map, slip, and weather report at the commencement of the race, and as soon as they have received the slip at controls.

The race will be over a course of approximately 500 miles, and there will be two or more controls with turning points between controls. At each turning point competitors will be required to fly over the turning-point at a height of not more than 200 ft. above the surface. At controls, competitors will be required to land and wait 50 minutes before proceeding on the next lap. At the expiry of 50 minutes they will be handed a slip on which will be recorded the order of the next places to be visited. The race will be open to all pilots who are of British nationality or who have been domiciled in the British Isles for at least five years, and to any type of *bona fide* civil aircraft. Pilots shall be alone in the aircraft.

6.—The main prize shall consist of a Cup valued at 50 guineas, which shall be competed for yearly. The Cup will become the permanent possession of any competitor who wins it three times in succession, while a replica valued at 25 guineas will be presented to the winner of each year's race. In addition, there will be other prizes, the nature and value of which will be announced later.

7.—The entrance fee for each aircraft will be £2 2s. No entrance fee will be returnable.

8.—Entries will be received by Airwork Limited, Heston Airport, Hounslow, Middlesex.

9.—Entries will be closed as soon as 60 entries have been received, but should any of these subsequently be withdrawn, entries in the next order of receipt will be considered. Unless a minimum number of 18 entries are received, the race will not take place.

10.—Competing aircraft shall be presented at Heston Airport by 6 p.m. on the evening of May 20, 1932, and shall remain at Heston Airport until the commencement of the race. The right of adjusting the handicap, if necessary, following inspection of the competing aircraft, is reserved. As far as possible, aircraft will be placed under cover for the night, but no guarantee will be given that this will be done.

11.—Entries will close at 5 p.m. on April 30, 1932, subject to paragraph (9). Late entries at double entry fee will be received up to 5 p.m. on May 7, 1932.

12.—The names of the officials (handicappers, starters, etc.) will be published later.

13.—The promoter of the race is the "Morning Post," 15, Tudor Street, E.C.4.

The Secretary of the race is R. P. G. Denman, Airwork Limited, Heston Airport, Hounslow, Middlesex, to whom all inquiries should be addressed, and from whom entry forms should be obtained.

CINQUE PORTS FLYING CLUB

The details of the country membership previously mentioned in our columns are as follow. For the sum of £1 1s. any owner of an aircraft living more than 30 miles from Lympne can join the Cinque Ports Flying Club,

obtaining full privileges of a full flying member. This entitles the member to free landings at Lympne, and housing in the club hangar at the ordinary club rates. The only time the Government will require a landing fee is when the member is returning from the Continent and wishes to clear Customs. Already there are many applications for membership.

Only one "A" licence was issued during February, but in view of the indifferent weather the number of flying hours, both dual and solo, were very satisfactory.

The club dinner and dance, held on January 30, was such a success that many members have asked for another to be given. It has been decided to hold another in the near future, and with a little more time in which to organise the function, it should be even better than the last.

THE DANUM AERO CLUB

The Mayor of Doncaster, Councillor A. A. Thomson, was in the chair at the inaugural dinner of the Club held on Thursday, March 10, having accepted the Presidency of the Club. Proposing the toast "The Mayor and Corporation," Mr. C. H. Peake suggested that the Doncaster of the future would aptly be described as the halfway house of the airway, highway and railway. He said that the club deserved the wholehearted support of the town as it was doing all the spade work.

The Mayor, proposing the toast of "The Club," stated that no town could claim to be in the walk of modern progress until it was making provision for the time when aircraft would be as commonly used as the motor car was today.

Proposing the health of Mr. Gordon Store, the guest of the club, the chairman, Mr. A. G. D. Alderson, said that the object of the club was to create a spirit of airmindedness in the district, to instruct men and women in the art of flying at reasonable cost, at the same time helping to form a national reserve of trained pilots, which was a very important thing. The Danum Aero Club would also provide facilities for commercial aircraft until such time as the Doncaster Municipal Aerodrome was ready to accommodate them.

Mr. Gordon Store recounted his experiences on his record-breaking flight to the Cape and enthralled his listeners, who gave him a great reception.

There was an enthusiastic gathering at dinner, followed by a very enjoyable dance. At midnight a Cabaret materialised eight dancing girls in appropriate costume of blue and silver, wearing blue flying helmets with silver propellers in front. A novel aircraft, containing two exhibition dancers, had been constructed for the occasion and arrived in darkness, showing navigation lights, to the accompaniment of a motor extracted from a vacuum cleaner. This outfit caused considerable mirth, especially as one or two people were under the impression that it was a club machine on which they were intended to fly.

MANCHESTER GLIDING CLUB

In FLIGHT for February 12 a paragraph referred to the Manchester Gliding Club. At the annual general meeting of the Manchester branch of the Royal Aeronautical Society, held on January 29, it was decided to amalgamate the gliding section of the R.Ae.S. with the Stockport Gliding Club. The name of the club, however, was to be the Gliding sub-section of the Manchester branch of the R.Ae.S., and not the Manchester Gliding Club as stated in that paragraph. Membership is limited to members of the R.Ae.S., and this section of the branch works under its own sub-committee, to which Mr. B. A. G. Meads is the Chairman and Mr. S. F. Coleman the Hon. Sec.

Instruction at Croydon

The Rollason Aviation Company are one of the first to answer the Air Ministry embargo which has recently been placed on instructional flying at Croydon. Mr. A. S. Muir has now joined the Company and the new concern will be known as the Rollason, Muir & Rickard Aviation Co.; together with "Timber" Woods and Mr. T. Nash, their instructional staff will be a very strong one. Joyriding and taxi work will, of course, be continued at Croydon, but instruction will in future be given at each of two aerodromes situated near to London, so that pupils

will in no way be inconvenienced. A particular feature is being made of night flying instruction in preparation for the "B" licence, as well as dual instruction in enclosed cabin machines, for which purpose Desoutters will be used. The strength added to this Company by Mr. Muir is considerable, for he may justly be called the *doyen* among instructional and joyriding pilots at Croydon, having been there since 1920. In spite of the competition of other schools, the Rollason Company has been doing particularly well of late, and only last week they passed out two more "A" licence pilots.

Airport News

CROYDON

THE week-end was, it is to be hoped, a forerunner of the coming summer season. The fine weather attracted many private owners to Croydon, and with the normal joyriding, school work, and regular services the atmosphere fairly hummed from morning to night.

On Saturday, a very large crowd assembled, under the auspices of Polytechnic Tours, and 200 people were taken for flights in *Hengist* during the afternoon. Capt. Dudley Travers was kept very busy. Polytechnic Tours are conducting organised tours by air to Switzerland this summer, and I believe that it will be possible to spend an 8-days' holiday in that country for an inclusive amount of £10 per head. This is a very moderate charge and should prove very popular. The journey by air is to be made in Imperial Airways machines. The bookings will no doubt be heavy, and the machines will be working overtime to cope with the demand.

New electric boundary lights are being installed; the existing gas lights are being dispensed with after years of faithful service.

On Sunday a new French machine arrived, in the form of the 3-engined Wibault-Penhoët 281 T.12 (which was described in *FLIGHT* for July 17, 1931. To all appearances it could easily be mistaken for a Junkers G.31. It is reputed to be extremely fast, and will make our H.P.42 appear a slow machine in comparison. The cruising speed is stated to be in the vicinity of 135 m.p.h. I am told these machines will operate the Air Union services in due course.

The latest Imperial Airways innovation is the flying of a civil air ensign just behind the pilot's cockpit. A small mast has been erected, and the ensign is flown while the machine is on the ground. Immediately the machine takes off the mechanic has to haul down the flag, and on landing hoist it again.

The Short "Valetta" is now complete, and is expected to take the air any day now. The undercarriage is a wonderful job, and altogether it is a beautiful job of engineering.

One hears stories of the omnibus owner from Essex who proposes to use his few small aircraft in a similar way to a 'bus fleet. Without wishing to damp his air-mindedness, I wonder if he will be asking for trouble. He has yet to contend with that efficient organisation known as the A.I.D., and pilots paid at the rate of £4 per week, with 1s. 6d. per hr. flying pay, which may damp his enterprise.

On Saturday we had an example of aerial transport being employed as a means of defeating a wayward young couple who intended appearing before the famous smithy at Gretna Green. The parents of one chartered the "Wessex" of Imperial Airways, Ltd., together with the services of Mr. Sam Wheeler. Racing the railway train, Mr. Wheeler made a very rapid trip northwards. The wedding ceremony did not take place.

It is understood, on good authority, that Capt. Anderson is likely to take over the business of British Air Transport, Ltd.

The traffic figures for the week were: Passengers, 781; freight, 33 tons. P. B.

HESTON AIR PARK

MONDAY, March 7.—As the Flying School is closed on Mondays, things are fairly quiet on that day, although several private owners took their machines out for short flights. Many club members have expressed their appreciation of the comforts of the new and much larger bar, while the enlarged restaurant has already this year been filled to capacity.

Tuesday, March 8.—Capt. Andrews, on his "Bluebird" G-AATS, cleared Customs for a tour to Spain.

Wednesday, March 9.—Mr. S. V. Appleby, a young air enthusiast, whose home is in the South of France and who has built an aeroplane of his own design, came over to England specially to learn to fly under Capt. V. H. Baker.

G-ABFP (Segrave "Meteor"), of the British Air Navigation Co., was flown to Paris and back by Mr. Styran to test the Marconi wireless set recently installed. Its usefulness was demonstrated by the pilot, while over Dungeness, being able to inform Croydon he was making direct for Heston, enabling the Customs to be ready for them.

Thursday, March 10.—G-ABFV, the "Puss Moth" belonging to Mrs. Spencer Cleaver, cleared Customs for Paris, with Mrs. Cleaver's son as passenger. From Paris the machine is going on to Switzerland.

Lt. Comm. Geoffrey Rodd, visited us in his "Puss Moth" G-AAYB, he looking extremely fit and bronzed as a result of his visit to Palm Beach, Florida.

Several planes from Heston visited the pageant held at Colchester during the afternoon, and were caught in severe snow showers on their return journey. Every credit is due to Mr. Ronnie Malcolm for getting back in his "Moth" G-AAAI, in spite of the absence of a compass in the machine. He had been forced down once and landed in a field with a very uneven surface and occupied by cattle and sheep. His description of his adventures was very humorous, as were his apologies for returning minus oysters.

Friday, March 11.—Two planes cleared Customs and proceeded to Ireland to bring back pictures of the preparations



ON PARADE: Some of the machines lined up on the occasion (reported in last week's issue) of the visit to Heston Airport, on March 5, of Members of the Executives Association.

for the Irish Sweep—one being from Air Taxis (G-AAYD) and the other from Hillmans Airways (G-ABSB)—both "Puss Moths." They both arrived back during Saturday afternoon.

The Director of Civil Aviation (Lt. Col. Shelmerdine) departed on an official air tour to Gloucester and Bristol.

Saturday, March 12.—The weather was exceptionally fine, but very cold, and the School machines were fully employed during the whole day in instruction.

Mr. Grahame White, who is becoming a very frequent week-end visitor to Heston, was again with us. He has had his first flight for ten years in one of the School machines with Capt. V. H. Baker. After the flight he was full of the advance made in aeroplane construction.

With so many important football matches on, taxi work was very much in evidence. Personal Flying Service sent two machines off—G-ABFO ("Desoutter"), with Maj. Clarke, to Cardiff for the International Rugby match, and

G-AAVT ("Hendy" 302), with Mr. Ledlie to Birmingham for the Football Cup Semi-final, while G-AAXZ ("Puss Moth"), with Mr. C. B. Wilson, went to Huddersfield for the other semi-final match.

Sunday, March 13.—G-EBTS, the "Fokker" monoplane, fitted with Bristol Jupiter engine, on which the Duchess of Bedford did her well-known flight to India, etc., cleared Customs for Berlin. It was piloted by Capt. C. D. Barnard, and conveyed the English Ice Hockey team, numbering nine.

It was a delightful morning, and the aerodrome was presenting a very busy scene when, just before 1 p.m., the wind changed to east, and London smoke came and blotted us out. Capt. Baker, who was up with a pupil at the time, said it presented an unusual sight, appearing as black waves rolling along very rapidly. The fog lasted with us for the remainder of the day, and caused many pupils and private owners much disappointment.

PARIS AND HER AIRPORT PROBLEM

AS we have previously noted in *FLIGHT*, Paris has been engaged for some time past in considering the problem of her airport, not only as regards improvements and enlargements of existing sites, but also as to their closer proximity to the city. For instance, M. Etienne Riche, Under-Secretary for Air in the late Government, announced recently that plans, involving an expenditure of 12,000,000 f. (£96,000), for the rebuilding of Le Bourget had already been adopted.

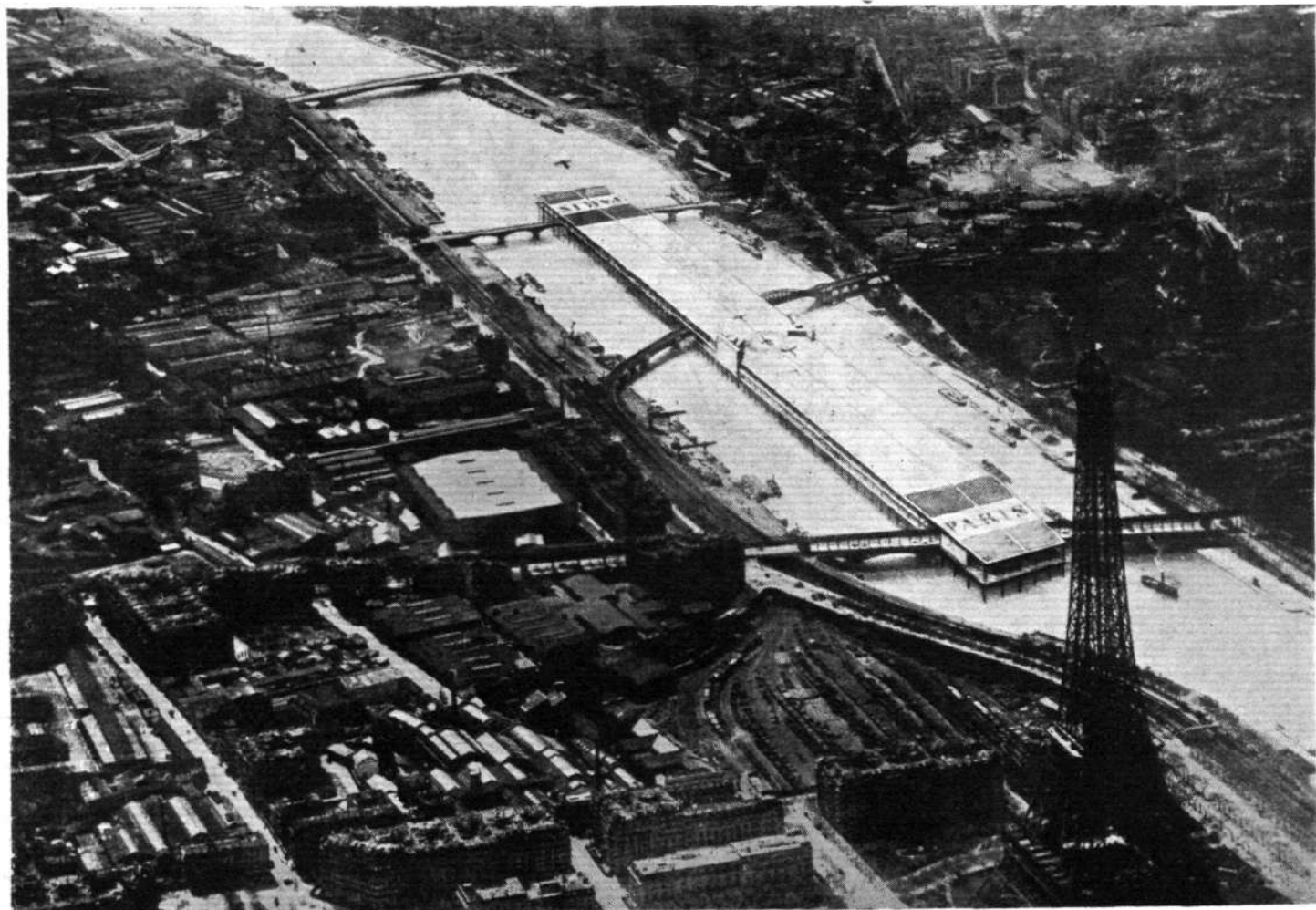
The funds will be provided from the National Equipment credits, and work will in all probability start within two months. Practically all the existing buildings will be demolished. On the site of the present diminutive Customs and restaurant building a spacious hall is to be constructed for the use of passengers.

On the first floor there will be a restaurant and first-class hotel accommodation. About thirty suites of rooms will be made available for the use of travellers who wish to wait for an aerial "connection" instead of undertaking the journey to Paris and back.

As regards bringing the airport nearer Paris, it has already been suggested that an elevated airport could be built over the parade ground at Issy les Moulineaux. Now, according to the Paris correspondent of the *Daily Telegraph*, another scheme has been submitted to competent authorities by M. Lurcat, a young engineer. He has prepared plans for the transformation of the small island in the Seine, between the Pont de Passy and the Pont de Grenelle, into a great landing stage for aeroplanes. The Ile des Cygnes is 2,700 ft. long and 90 ft. wide.

M. Lurcat considers that this narrow stretch of land could be made 210 ft. wider by means of piers without interfering with river traffic. He would make the landing platform a two-storey structure, thus providing space beneath the actual platform for 200 small aeroplanes.

When the wind was favourable the largest air liners could land on the Ile des Cygnes with safety. When it was not, they could disembark their passengers at Le Bourget, and the passengers would be brought to the centre of Paris in small autogiros.



AN AIRPORT ON THE SEINE: A composite aerial view of Paris showing the elevated aerodrome, built over an island in the river, suggested by M. Lurcat.

THE ROYAL AERO CLUB OF THE UNITED KINGDOM

OFFICIAL NOTICES TO MEMBERS

Annual General Meeting.—The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held at 119, Piccadilly, W.1, on Wednesday, March 30, 1932, at 8.30 p.m.

Election of Committee.—In accordance with the rules the Club shall be governed by a Committee of 18 members. Members shall be elected to serve for two years, half the Committee retiring annually.

Nominations of Candidates.—Nominations of candidates for election to the Committee must be received by the Secretary not less than 14 days before the Annual General Meeting, with an intimation in writing that the members nominated are willing to serve. Nominations of candidates shall be signed by at least two members proposing them. The following members have so far been nominated:—Lt. Col. W. A. Bristow; *Capt. H. S. Broad; *Maj. C. J. W. Darwin, D.S.O.; *W. Lindsay Everard, M.P.; *Maj. A. Goodfellow; *Col. F. Lindsay Lloyd, C.M.G., C.B.E.; *John Lord; *Lt. Col. J. T. C. Moore-Brabazon, M.C., M.P.; *Lt. Col. Mervyn O'Gorman, C.B.; Edgar W. Percival; *Maj. H. A. Petre, D.S.O., M.C.

The names of the retiring members of the Committee are indicated by an asterisk. Retiring members are eligible for re-election.

House Dinner.—A house dinner will be held at the Royal Aero Club on Wednesday, March 30, 1932, at 7.30 p.m. The price of the dinner is 6s. Members wishing to attend are requested to notify the club beforehand.

The dinner will be followed by the Annual General Meeting of the Club, at which members will have the opportunity of discussing the affairs of the club.

King's Cup Air Race, 1932.—Intending competitors are reminded that the race will take place on July 8 and 9, 1932, and that the Entries close at 5 p.m. on April 1, 1932.

The entry fee is £10 and must be paid to the Royal Aero Club, 119, Piccadilly, London, W.1. Late entries at double entry fee will be received up to 5 p.m. on May 1, 1932. Regulations and entry forms may be obtained from the Royal Aero Club, 119, Piccadilly, London, W.1.

Offices: **THE ROYAL AERO CLUB,**
119, PICCADILLY, LONDON, W.1.
H. E. PERRIN, Secretary.

Airisms from the Four Winds

Lady Chaytor's Fashion Flight

ON March 5 last Lady Isabel Chaytor left Lympne in a D.H. "Gipsy Moth" piloted by Mr. R. T. Richards, en route for Australia with the object of giving a series of lectures on British Fashions. The first day's journey ended at Linz, and when landing at Sofia on March 9 the machine turned over in the soft snow and was slightly damaged—the occupants being, however, only bruised and shaken.

Miss Sewell's Lone Flight

MISS IRENE SEWELL, who left Gatwick in a "Gipsy Moth" on February 23 on a lone flight to Transjordan, has been weatherbound at Naples for nearly a fortnight. She was able to resume her flight last week-end when she accomplished a splendid trip to Campania in 3 hr. 50 min. in such bad weather conditions that a German pilot, who left Naples shortly after for the same destination, had to return to Naples.

King Albert's Congo Visit

WHEN the King of the Belgians pays a visit to the Belgian Congo, during Easter, where he will inspect the National Albert Park, he will make the journey by air as far as possible.

Vicomte de Sibour "Lost" in Africa

VICOMTE DE SIBOUR and his wife (a daughter of Mr. Gordon Selfridge) left Dakar, Senegal, by aeroplane on February 26 en route for Niamey, in Central Africa, in order to assist Mlle. Maryse Hiltz, who is stranded nearby. As no further news of their progress or arrival at Niamey was received up to last week, some anxiety was felt as to their safety. On March 14, however, news was received that they were safe, and had reached their objective.

Prof. Piccard's Balloon Ascent

It is announced in *The Times* that Prof. Piccard has



A STUDY IN UNDER-CARRIAGES: Mr. Hagg, the D.H. Chief Designer, seems to be getting ideas for a new undercarriage from Mr. Lamplugh of the British Aviation Insurance Group, who, instead of contenting himself with flying in safety, has been indulging too strenuously in squash racquets.

(FLIGHT Photo.)

finally decided that the second balloon ascent into the upper atmosphere, which he is organising, shall take place, like the first, from Augsburg. Although all the arrangements are in the hands of Prof. Piccard, neither he nor Dr. Kipfer, his companion on the last occasion, is taking part in the ascent, which will be made by M. Cosyns, a young Brussels physicist, a pupil of Prof. Piccard and already well known as a balloonist. The date of the new attempt is fixed for May 27, the anniversary of the experiment last year. The envelope of the old balloon is being employed again, but a new sphere is being constructed at Liège which will make an ascent less dependent on favourable weather conditions than on the previous occasion. The venture also is receiving financial support from the Belgian Fonds National de Recherche Scientifique.

Cost of a Bomber Squadron

SIR PHILIP SASOON, Under-Secretary for Air, stated in the House on March 2 that the annual cost of a Regular single-engine bomber squadron at home may be stated in round figures as about £85,000 under present conditions, and that of an Auxiliary Air Force squadron as about £50,000.

Women and Old Men Flying Pupils

IN the House of Commons on March 15 Mr. W. R. D. Perkins, speaking as an owner pilot, said that not more than 600 of the 6,000 pilots turned out by the light aeroplane clubs would be useful to the country in time of war. Many of them

were women, and, with some exceptions, women in the air were notoriously dangerous and inefficient. He would rather fly in formation with a winged dragon than with a woman pilot. There were also old gentlemen of 50, 60, or even 70, being trained as pilots. It was indefensible to



FOR GUNNERY INSTRUCTION: An aerial view of one of the Avro 626 Advanced Training aeroplanes, showing the machine fitted up for instruction in observers' gunnery.

spend large sums of money to give these old gentlemen cheap and almost free flying. He suggested withholding the subsidy for a pilot over 40, for one who did not fly at least 30 or 40 hours a year, and for women pilots.

More D.H.'s for Brazil

WITHIN three months of the conclusion of a contract with the Brazilian Ministry of War for the supply of 15 training biplanes the de Havilland Aircraft Company, Ltd., announced that it had secured an order for the supply to the Brazilian Navy of 12 similar machines. The Brazilian Army consignment is now on its way to Rio de Janeiro, and the first batch of the aeroplanes intended for the Navy will be ready for despatch in about two months.

The N.W. Frontier of India

DURING the past week there was a recrudescence of unrest among the tribesmen to the north and north-west of Peshawar, and for a time heavy rain storms flooded the aerodromes at Peshawar and elsewhere. No. 20 (Army Co-operation) Squadron is permanently stationed at Peshawar. At Risalpur, some 25 miles away, are Nos. 11 and 39 Bomber Squadrons, both equipped with "Harts." The other five squadrons in India (two of them at Kohat, nearby) all have "Wapitis." Whenever the weather permitted, formations set off to bomb villages in the disturbed area, after due warning had been given. On Friday, March 11, a formation had the good fortune to find a *lashkar* (tribal force) and bombed it, which is reported to have had far more effect than the setting on fire of empty villages. The special correspondent of *The Times* says "the R.A.F. has certainly made its best showing in recent history on the Frontier."

The Persian Gulf Route

DURING the debate on the Votes of the Air Estimates, Sir Philip Sassoon, Under-Secretary for Air, stated in the House on Tuesday, March 15, that we had obtained an extension of two months of the agreement with the Persian Government, whereby British aircraft are allowed to fly along the Persian shore of the Gulf, that agreement being due to terminate on March 31. Sir Philip hoped that this extension would lead to a further extension, and perhaps greater security of tenure. As we had not known that it might be possible to continue the arrangement, we had had to make provision for using the southern shore of the Persian

Gulf, so as not to be compelled to sever this very important link in the chain of our service to India.

Icebound Crew Fed from the Air

ON March 13 an aeroplane dropped food to the crew of the 1,600-ton United States vessel, *Fellowcraft*, which is icebound in Lake Erie, Ontario.

R.A.F. Touring Flights

THREE "Southampton" flying boats of No. 205 (Flying Boat) Squadron left their base at Singapore on Tuesday, March 15, on a cruise to Darwin in northern Australia. The Royal Australian Air Force will co-operate in this cruise. The four "Fairey III F" machines of No. 8 (Bomber) Squadron, which had made a flight to Egypt and the Sudan, returned to their base at Aden on Sunday, February 28. Three "Victorias" of No. 216 (Bomber Transport) Squadron are returning the visit of No. 8 B.S. from Aden. They left Heliopolis on March 3 and arrived at Berbera on March 15.

The Collins Scholarship

OLD Boys of the Worcester Royal Grammar School are helping to endow a leaving scholarship in memory of F/O. Reginald Stradling Collins, who lost his life while serving with the aircraft carrier *Courageous* near Malta. Mr. J. M. F. Cassidy, 64, High Street, Worcester, is treasurer of the fund.

Air League Vice-Presidents

THE Earl of Athlone and Lt. Col. J. T. C. Moore-Brabazon, who have for some time been taking a great interest in the work of the Air League of the British Empire, have now been elected Vice-Presidents of that organisation.

Aiding the Aviator

RECENTLY a member of The Automobile Association, flying a light aeroplane from Belfast to London, was obliged to land near Stranraer owing to low cloud. As conditions gave no sign of improving, he was faced with the problem of what to do with his aeroplane, which could not be left unsecured all night. Fortunately, an Automobile Association Patrol who arrived on the scene was quite equal to the occasion. He produced, by apparent magic, suitable pegs which he drove into the ground, lengths of rope with which he tied the aeroplane to the pegs, and finally covered the engine and cockpits with tarpaulins borrowed from a neighbouring farm. Thus both pilot and aircraft spent a peaceful night.



FROM FIJI: A Spartan (Hermes II) seaplane which Mr. Gordon Fenton has operated in the Fiji Islands for over 500 hours without any untoward events.

Air Transport

Land-Sea-Air Routes

EMPHATIC success is attending the system, operating now over thousands of miles of air, land, and ocean routes, whereby shipping companies, railways, and airways all combine to accelerate the transport of urgent merchandise.

Air transport does not supersede other forms of travel. It supplements them, and co-operation between air, sea, and land transit, instituted already on a comprehensive scale, is productive of time-savings which are vital to the business world.

Now that the Imperial Airways African route extends right through from Cairo to Capetown, it has become possible, by a use of the combined facilities offered by ocean liners and air liners, to send an urgent parcel from New York to Capetown, via London, in not more than 18 days, as compared with 28 to 32 days by any other form of transport, even though by the more direct route. Accurately-scheduled connections between sea and air travel also permit consignments of urgent freight from America to India to complete their journeys in 14 days, as contrasted with about 28 days if surface transport only is employed.

Along the 13,000 miles of British airways stretching eastward from London there are approximately 50 main and intermediate stations, and these are now connected by an express air-rail service with approximately 150 railway stations covering the whole of this country.

The system which has been established, and which is being made use of on a rapidly-growing scale by business

houses, is simple as well as expeditious. An urgent parcel, handed in, say, at the railway station at any of our big provincial cities, has a special label attached to it, and is then forwarded to London by the next express train. From the terminus in London it is collected by an Imperial Airways van and taken to the airport at Croydon, being then despatched by air to its destination on the next outgoing plane. And what the plan means, in actual operation, may be judged from the fact that time savings of as much as a month are often effected, now, on journeys to destinations along the Indian and African air lines.

Passengers, as well as mails and freight, reap the benefit of the inter-working between land, sea, and air travel. A business man voyaging, say, from New York, and who is in haste for an appointment in London, can, through the purser of his liner, and by invoking the ship's wireless, engage an air-taxi to pick him up at Cherbourg and fly him straight through to the London airport, thereby saving much valuable time; while on the Indian and African routes of Imperial Airways, after flying from London to Paris, passengers change from airway to railway and continue on through the night by sleeping-car train to Brindisi, where they find awaiting them one of the big multi-engined flying-boats for their voyage on above the Mediterranean.

Experts who are studying transport progress on a widespread scale now find one of the happiest auguries in the growing spirit of co-operation between the travel systems of earth and air.

Commercial Aviation in America

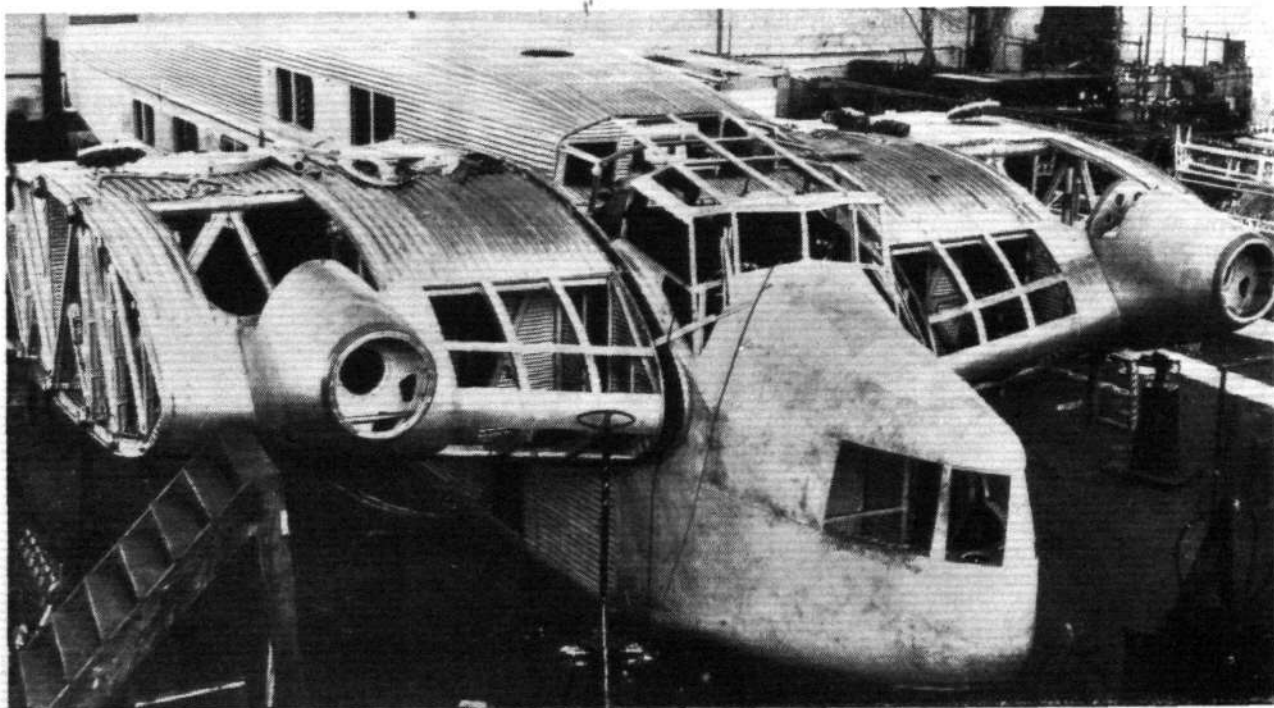
ACCORDING to statistics issued by the Aviation Branch of the United States Department of Commerce, air travel continues to increase in the United States. It is estimated that 457,340 passengers were carried over domestic air lines during 1931, as compared with 374,935 during 1930. Aeroplanes manufactured in the country during 1931 totalled 2,800, as against 3,437 in the preceding year. Schedule air passenger lines reported 41,416,688 miles flown, and 104,018,022 "passenger miles" flown during 1931. During 1930, miles flown totalled 31,712,541, and "passenger miles" flown 84,015,572. During 1931, air lines carried 787,353 pounds of express matter as compared with 359,523 pounds in 1930.

A Manx Air Service?

It is reported that British Amphibious Air Lines, Ltd., have made definite plans for the inauguration of an air service between Douglas and Blackpool during the coming season. An agent has been appointed at Douglas and several bookings for the Easter holidays have already been made, when the service will start between Belfast, Douglas, and Blackpool. A Saro "Cutty Sark" amphibian, fitted out as a six-seater, will be employed.

Aéropostale Subsidy

A SUBSIDY equivalent to £500,000 gold for the Compagnie Générale Aéropostale has been approved by the Finance Committee of the French Chamber.



A TWO-STOREY AIRBUS: The large Junkers G.38 airliner has been modified to meet the demand for extra passenger space by the addition of a "second storey" on top of the fuselage, between the wings. A smoking compartment has also been provided. The machine will be put into service between Berlin and London.

THE AIR ESTIMATES

Sir Philip Sassoon's Speech

INTRODUCING the Air Estimates on Thursday, March 10, on the motion to go into Committee of Supply, Sir Philip Sassoon, Under Secretary of State for Air, made the following speech:—

The Estimates which I have the honour to present to the House bear in every part the imprint of an earnest and, I venture to submit, successful effort to contribute substantially to the urgent requirements of the financial situation without permanently impairing the high standard of efficiency of the Air Services.

The net Estimates, at £17,400,000, are down by no less a sum than £700,000, a particularly heavy decline on the comparatively small total expenditure of an expanding and developing Service. There is also a large reduction in the gross figures due to decreased Appropriations-in-Aid in respect, primarily, of the Royal Air Force in India, the re-armament of which is now virtually complete, and also of the Fleet Air Arm for which, as for the remainder of the Air Force, there are no new formations to be provided during the coming year.

To effect so large an economy with the minimum of injury to the Service has been a difficult task to which the Air Council have devoted long and anxious thought. It has been achieved by a variety of expedients, many of them admittedly makeshift measures which it will not be possible to repeat another year.

The reductions in pay both of Service and Civilian personnel decided upon by His Majesty's Government last autumn, as part of a general reduction in public Salaries and Wages, have contributed to the economies effected. Owing, however, to the comparatively small numbers of Air Service Personnel, the saving under this head is necessarily small also.

But, of course, the cuts bore very hardly on individuals, and I should like to pay a tribute to all ranks of the Royal Air Force for the splendid spirit which they displayed on learning of the decisions of His Majesty's Government in this regard. There was ready recognition of the country's needs and of the fact that it was the duty of the Royal Air Force to bear its part in the sacrifices required of the nation.

The fall in the prices of commodities has rendered it possible to budget on a materially lower scale under Vote 2, and to a lesser extent under certain other votes.

Vote 3, representing as it does over 40 per cent. of total air expenditure, has inevitably had to make the largest individual contribution to the reductions demanded of the Air Ministry. It will be noted, however, that the reduction in the net figure is proportionately lower than on other Votes, such as that for Works and Buildings, which is down by nearly 8 per cent.

I need not dwell upon the obvious importance of an adequate expenditure upon Technical and War-like stores, and upon continued Experiment and Research, to the efficiency of the Air Service and the safety of its personnel. The Air Council have been most careful, in effecting their economies under this head, to ensure that adequate provision shall be left for the proper maintenance of machines and engines and their ancillary equipment. No measure of economy could be justified which would increase the risks taken by the personnel of the Air Force in the performance of their duties.

It is that over-rigorous fact which has made the task of the Air Council in allocating the reductions demanded of them in the interests of national economy so difficult. It has rendered it necessary to make sacrifices in many directions in which, in happier times, the maintenance and even an increase of expenditure would have been desirable.

In this relation I may refer to the decision to break up the R. 100, from which a substantial saving will be realised; and the cancellation of the 33-ton flying boat which has been designed for passenger and mail service over the Mediterranean.

Firm believer as I am in the future of flying boats, I confess to a personal regret at the inevitable necessity for abandoning this big civilian boat with its capacity for carrying 40 passengers, long range and good sea-going qualities. The fact remains, however, that the £100,000 which its building would have entailed would have exhausted all the money now available for the development of other designs of more immediate importance to civil aviation. In this, as in other matters, it has been necessary to cut our coat according to the cloth.

Another enforced economy that has been undertaken with great reluctance is included in Vote 4. The saving of £140,000 on Works, Buildings and Lands has only been achieved by postponing improvements and renovations which are urgently needed. The cost of providing works, buildings and lands for a new Service is necessarily heavy. Although during the past ten years expenditure on these heads has been considerable, many units of the Air Force are still accommodated in temporary buildings of war-time construction. Apart altogether from any question of the health and comfort of the personnel concerned, these temporary buildings have outlasted the period of service for which they were designed; they are constantly in need of patching up and consequently are exceedingly uneconomical to maintain. The decision to postpone for this year the replacement of certain of these temporary structures is therefore no more than the choice of what is for the moment the lesser of two evils. It cannot be repeated indefinitely.

Having regard to the full explanation given in my noble friend's accompanying Memorandum, I do not think that there are any other financial features of these Estimates to which I need specifically invite the attention of Hon. Members. I would like, however, to remind the House, as they were reminded also when the Air Estimates were presented last year, that last year's Estimates, despite a steady growth in the size of the Royal Air Force and continuous improvement in its technical equipment, were actually lower in total than the Estimates for 1925. The minute supervision and vigorous pruning of all heads of expenditure which made that result possible have necessarily added to the difficulty of finding the further savings which have been required and realised in these present Estimates.

I will now, with the permission of the House, turn from the narrow, though more than ever vital, field of finance and will attempt to give the House, as is customary on these occasions, a brief survey of some of the major activities of the Air Force and of the development of civil aviation.

It was my privilege and good fortune to make during the recent Recess a comprehensive round of British overseas air stations. In the course of it I covered some 8,000 miles by air, in a variety of Service and civil machines, and revisited units of the Air Force stationed in Malta, Egypt, Palestine, Trans-Jordan, Iraq, the Persian Gulf and India. The journey brought home to me, even more forcibly than did my former official tour, the far-reaching character of the revolution, for it is no less, which air transport is working in the sphere of world communications. For, whereas the stages of my previous journey were specifically worked out beforehand and the tour itself was in the nature of a test or experiment, my recent tour was one which might have been carried out by any private individual sufficiently interested in the different places to which it took me.

I was greatly struck with the remarkable progress of the last five years. I wish that it were possible to put before the House a large scale map of the world, which would give Hon. Members a clear picture of this progress. They would then see, if I may employ a phrase coined in different though not unconnected circumstances, that this map is in process of being covered, steadily and methodically, by a network of "thin red lines"; the lines, that is, marking the course of air routes developed or being developed by the pioneer enterprise of the Air Force and followed, or being followed at no distant interval, by regular civil air transport.

Once again, trade is following the flag; but by new routes and routes no less romantic, even in these days of ever-growing scientific attainment, than in any period of our history.

Everywhere that I went I found those responsible for administering the far-flung territories of our Empire to be profoundly impressed by the rapidity with which the mobility of the Air Arm is growing, and with the "ubiquity," if I may so style it, of British aircraft.

Everywhere is proof of that interesting and—to my thinking—most satisfactory feature to which I have referred: namely, the way in which military and civil activities have followed one another and fulfilled complementary rôles.

It is a feature which seems to have come into being naturally and spontaneously at the very beginning of things. In the early years after the war it was the Royal Air Force which blazed the trail across the desert areas which lie between Egypt and Iraq, to be replaced in due course by the weekly civil air service which today carries our mails to and from India. Similarly, the series of regular annual flights by Air Force machines in formation from Cairo to the Cape has gradually opened up for a regular civil service the very difficult country in Central Africa.

Despite a number of adventurous private flights, the successful accomplishment of which has moved our wonder and admiration, the geographical and climatic conditions of Central Africa present an obstacle to regular civil air transport which the present resources of civil aviation would have found insuperable without the aid so given. It is to the friendly and helpful co-operation of military and civil flying that we owe the fact that a civil air mail service from London to the Cape is now in weekly operation.

I need not dilate upon the commercial value of the quicker communications which have thus been established between Great Britain and India on the one hand and the Dominion of South Africa and all the Central and East African administrations on the other, nor upon the great benefits which should in due course accrue therefrom in the fields of politics and trade alike. I should like, however, in passing, to pay a tribute to all the African administrations concerned in the development of the African route and, in particular, to the Government of the Union of South Africa for the ready co-operation they have given and the substantial financial contribution they are making to this new link in the chain of our Imperial communications.

It is proper to point out that this pioneering work, by which the Air Force is clearing the trail for future civil air lines, is not the cause of any special expense to the taxpayer. The efficiency of the Service and the strategic needs of the Empire alike demand that long-distance Service flights should be carried out at regular intervals so that our aircraft and personnel may at all times be ready for the efficient discharge of their military duties. It is our good fortune that these experimental service flights, so necessary for the training of the Air Force, can so readily be turned to good account also as a means of opening up new civil air routes.

This pioneering rôle is by no means finished. A flight from Egypt to West Africa is now a regular annual feature in the programme of the units of the Middle East Command. Hon. Members will have seen in my noble friend's Memorandum a reference to the flight which left Egypt last October for a cruise to Nigeria and the West African Colonies. They will have read of the unfortunate interruption of that cruise by the outbreak of yellow fever in the Gold Coast. That interruption, however, is only a temporary matter. The flight will be repeated in due course, and we may reasonably hope that in time a branch civil air line will be brought into being which, connecting with the Cape-Cairo route at some point in the Sudan, will bring the West African Colonies—Nigeria, the Gold Coast, Gambia and Sierra Leone—within a few days' journey of this country.

One of the Squadrons of the Middle East Command is at the moment engaged upon a flight in East Africa, visiting Kenya, Tanganyika and Uganda, the itinerary of which will cover some 7,000 miles.

Again, Air Force machines now fly regularly along the barren shores of the Persian Gulf between Basrah and Muscat, and experimental flights have been made from Muscat eastwards and thence along the southern coast of Arabia towards Aden. To link up with these operations, the Squadron at Aden has been extending its sphere of activity north-eastwards and is gradually opening up the little-known territories of the Hadramaut littoral.

Some time ago the Air Officer Commanding in Iraq flew from Basrah, a distance of some 1,715 miles, to Murbat on the South Arabian coast by flying boat and there joined hands with the Officer Commanding at Aden, who had flown 750 miles north-eastwards with a flight of land planes to meet him. In the reverse direction a flight from Aden to Egypt and back has lately been concluded, while a unit from Egypt has now started on a return visit to Aden. So the whole vast perimeter of the Arabian Peninsula is being encircled by air.

As I have informed the House, I myself was privileged only a few weeks ago to fly along the southern shore of the Persian Gulf and to visit the little-known and desolate Trucial Coast between Bahrein and Muscat, passing *en route* over the boldly jutting hon's paw of the Nusandir Peninsula. It is a surprising seascape, with steep and rockbound cliffs, but with many inlets where flying boats can take temporary shelter.

Farther East, beyond India, the squadron of flying boats based on Singapore has, in the course of the past few years, cruised far and wide both south-eastwards via the Dutch Indies towards Australia, and north-eastwards to India, exploring alternative routes by way of the coasts of Siam and Burmah and via the Nicobar and Andaman Islands. On the 15th of this month three Southampton flying boats will leave Singapore on a training flight to Port Darwin, where they will be met by six land planes of the Royal Australian Air Force and initiate liaison with the Australian Air Force similar to that already established with the South African Air Force by the regular flight to the Cape to which I have already referred.

The experience which is being gained by these cruises, and the knowledge acquired of favourable or adverse geographical and weather conditions, are most useful and indeed essential for Air Force purposes, as well as being invaluable to the organisers of our civil air lines.

Besides long-distance flights of this kind, which are undertaken with the double purpose of preparing the Air Force overseas for any military eventuality and at the same time of opening up fresh routes for civilian enterprise, the Air Force is now continuously engaged in minor activities of what I may call a "productive" character. In all parts of the world it is constantly being called upon to carry out innumerable miscellaneous jobs, such as searches for

parties lost in the desert, the conveyance of medical assistance to remote stations, or the transport of serious cases from such stations to a centre where they can receive skilled medical treatment.

It was the custom to say, in the days when the world was larger than it is now, that wherever one went one was sure to find that a Scot had got there first. Today, when the world has so far contracted that men of all nationalities can get themselves into trouble in its most remote corners, it can be said with equal truth that wherever in the world one may get into difficulties, the Royal Air Force can safely be relied upon to turn up in time to extricate one from the worst consequences of one's misfortunes.

Whether it is the discovery of a touring car of the Egyptian State Telegraphs lost in the sand wastes of the Libyan desert; the giving of a helping hand to a District Commissioner in the collection of taxes from semi-nomadic tribes whose sense of public service has not yet risen to the heights attained by British income taxpayers; the conveyance of an appendicitis case across 500 miles of desert from the Darfur district to Khartoum; the carrying of water and supplies to an African Trade Expedition stranded north of Wadi Halfa with only one small bottle of water left between them; the conveyance of supplies and mails to and moral support of a Political Agent on tour in the North-West Provinces of India; the location and provisioning of an Italian aircraft forced-landed on the Somali Coast, the escort and evacuation of sick members of a column operating in the hinterland of Aden, or the conveyance by flying boat from Ras-al-Khaimah to Bahrein of the Sultan's brother for treatment for eye trouble—at all times and in all places the *deus ex machina* is a unit of the Royal Air Force.

It would be easy to multiply instances from a mass of cases out of which I have of necessity referred very briefly only to a very few. The examples I have given will serve, I trust, to bring home to hon. members what I mean when I speak of the ubiquity of the Air Force, and will help to give them a better idea of its constant activity and astonishing mobility.

The demands of this kind are indeed so frequent that they are treated as a matter of routine. They hardly feature in the reports; but they are helping to maintain the prestige of the British flag and the good name of Great Britain in all parts of the world, and they are carrying peace and order and civilization to many backward peoples. They are the direct and indirect means of saving many lives, both European and native, and what is no mean consideration in these days, they save also the expenditure or the loss of large sums of money.

I confess that I find this aspect of the work of the Royal Air Force peculiarly fascinating; but I must have thought for the feelings of hon. members and pass on to certain other matters to which the House will expect me to refer before I resume my seat.

During the past year there have been no exploits of the kind which give public prominence to the work of the Air Force overseas, but I would like to mention the operations which were very skilfully and successfully carried out by the air forces in Iraq in conjunction with the Iraq Army, which ended in the surrender of Sheikh Mahmud and in the elimination thereby of a constant source of unrest and disturbance in Kurdistan. I might also mention the conveyance of troops to Cyprus at very short notice which was interesting as the first occasion of the transport of troops by air across a considerable width of sea, but which, apart from the significance of that feature, was a comparatively small affair. This year one must look at home to find the exploit for which the year will be remembered.

The facts and figures concerning the winning of the Schneider Trophy and the setting up of a new high-speed record for the world are set out in my noble friend's memorandum. I need not further refer to them; but it is my wish, and I think also my duty, to pay tribute in this place and on this occasion to the supreme skill and thoroughness of the designers and constructors of the engines and machines with which our victories were won, to the technical staffs of the Air Ministry and the National Physical Laboratory who collaborated with them, to the high courage and astonishing mental and physical efficiency of all members of the High-Speed Flight, from whom the winning pilots were chosen, and to the splendid public spirit and generous patriotism of Lady Houston, without whose munificent gift there would have been no British entry.

There can be no doubt that such notable proof of the outstanding excellence of British design, British material and British workmanship has been of real assistance and value to the British aircraft industry, and in maintaining the high reputation of British workmanship in general. The experience gained in the making of the winning machines and engines has also been of real value in the designing of new equipment for the Air Force. The result is that, though reckoned by size alone, the Royal Air Force still takes only fifth place in the air forces of the world, we have at least the satisfaction of knowing that no other air force is better equipped and in no other air force is the standard of training and efficiency so high.

But it is my plain duty to enter a warning that to maintain this standard we shall inevitably require in 1933 and future years substantially more money than the House is being asked to vote in these Estimates.

By the end of 1932 the equipment of the regular Squadrons with machines of comparatively recent design will be practically complete. We should have carried the process of rearmament a good deal further but for the financial crisis, which has necessitated the heavy cut I have already mentioned in the Vote for technical equipment. When this year's programme is complete, thirty-three squadrons will be equipped with types introduced into service in 1930 or later. Practically all the remaining Squadrons in First Line will be equipped with machines introduced into service not earlier than 1926.

The turning over of fighting aircraft from wooden construction to metal is now virtually complete. Apart from other advantages, a substantial lengthening of the life of aeroplanes between overhauls is expected to result from the change. With the exception of single-seater fighters, where manoeuvrability is of first importance, flying boats and certain obsolescent or experimental aircraft, all aeroplanes in service are now fitted or being fitted with slots.

The taxpayer is given some opportunity to judge of the general efficiency of the Air Services on the occasion of the annual Air Exercises which in the year now under review took place in July and completed some 2,000 hours flying without untoward incident. A feature of these exercises was the part taken, for the first time, by Cadre Night Bombing Squadrons (which are composed partly of Special Reserve personnel). Auxiliary Air Force Squadrons also took part again in the day bombing operations.

That the standard of flying and general training of the regular Squadrons should have been high is only in keeping with the fine tradition which the youngest of the fighting services has already made its own. No pains are being spared to increase that efficiency still further, particularly in respect of "blind" flying with the aid of special instruments, deck landing, and armament training, in all of which directions definite progress is being made. It is, however, peculiarly satisfactory to know that the units containing non-regular personnel, both Cadre and Auxiliary, are able to take part in large scale exercises with regular units, not only without discredit, but with an efficiency which actually exceeded the expectations of those who were responsible for the experiment of introducing this element into the Home Defence Force.

There has been a satisfactory increase of strength in the Cadre and Auxiliary Squadrons during the year and the general standard of flying remains high. As regards the University Squadrons, the number of hours of flying has again

increased, and for the first time formation flying has been introduced for the more experienced members of these units. Both Squadrons were maintained at full strength throughout the year, and each has a long waiting list.

The country may rest assured that it is getting very good value indeed for the money spent upon the units with non-regular personnel. During 1931 a number of officers who joined the Auxiliary Air Force in its early days completed their initial periods of service. Of these, some have relinquished their commissions and returned to civil life; others, I am glad to say, have found it possible to re-engage for further service; yet others have transferred to the Reserve of Air Force Officers. I should like to take this opportunity of thanking all officers and airmen who gave their support to the Auxiliary Air Force at the beginning of its career for the part they have played in making it the success which it is today.

I may now turn, by a natural transition, to say a few words about civil aviation. I have already referred to the inauguration of the through service to the Cape. That is a step taken to build up on solid foundations the network of Imperial air routes which will one day link together all parts of the British Empire. Despite substantial reductions of mileage flown in Australia and Canada, as a result of acute financial depression, the total mileage flown in the British Empire during 1931 upon routes in regular operation shows an increase of some 9 per cent. upon 1930. Proposals are on foot for bringing into operation, it is hoped in the near future, another 12,000 miles and more of Empire routes, and, when these have been opened, the Empire will possess over 37,000 miles of organised air routes.

The total mileage of Empire lines compares very favourably with that of all other countries except the United States of America, which, owing to her geographical size and position, is so well suited for the development of air transport. In fact, with the exception of the United States of America, the British Empire mileage is the largest.

We have always pursued in this country a policy of avoiding undue coddling of air transport by State financial assistance and have followed conscientiously the plan of encouraging air transport in such a way that it may be able at the earliest possible moment, to "fly by itself." The result is that, though it is clear that the process will take much longer than was at one time hoped, few other lines, if any, can show so satisfactory an approach towards a commercial basis for their operations as do the air lines of the British Empire.

Another eminently British and satisfactory feature of civil aviation in the Empire is the continued growth of amateur flying through the medium of light aeroplane clubs. There is a substantial increase in the number of flying licences and certificates of registration current during the past year. No doubt, a revival of general industrial prosperity would result in a marked improvement in this direction.

There has also been an increase in the number of aerodrome licences issued during the year, due principally to the big development in the activities of "joy riding" companies. As an example of growing air-mindedness, this is all to the good; but it is very desirable that greater progress should be made in the provision of, or at any rate the reservation of, sites for municipal aerodromes. The day cannot be far distant when every city of any importance will have its permanent aerodrome; and delay in securing convenient sites can only result in increasing unduly the cost of providing them.

At the present moment there are no more than 57 licensed permanent aerodromes, landing grounds and seaplane stations in Great Britain. It may be that, in view of the existing financial stringency, it is too much to expect municipalities to embark upon the comparatively heavy expenditure involved in the establishment of a permanent aerodrome, but I do urge that the authorities concerned should decide without delay upon the location of their aerodromes and secure sites from being built over. I hope that other municipalities will be quick to emulate the foresight and enterprise of those which have already taken in hand work of this kind.

Outside Great Britain, a large number, some 16 in all, of private long distance flights have been carried out during the year with a very satisfactory freedom from serious accident. Outstanding among them, though all were remarkable performances, are Squadron Leader Bert Hinkler's solo crossing of the Southern Atlantic from West to East in a Puss Moth, Miss Salaman's and Mr. A. G. Store's record flight to the Cape in less than five and a half days, Mr. J. A. Mollison's record flight from Australia to England in under 9 days, and Mr. C. A. Butler's record flight from England to Australia.

Before passing from the subject of civil aviation, I might perhaps mention that a Convention for the unification of certain rules relating to international carriage by air was signed at Warsaw in October, 1929, on behalf of this country, Australia and South Africa. It was also signed then, or subsequently, on behalf of 20 foreign countries. In July last H.M. Government decided to ratify the Convention, and hon. members will be interested to know that it is hoped to introduce the necessary legislation shortly.

Time is getting on and I will therefore reserve what I have to say on certain very important issues—more particularly disarmament and airship development—until a later stage of the debate.

Nor can I deal, as I should have wished to do, with technical development and research; these are subjects which in themselves might easily take up more of the time of the House than I have already occupied. No doubt hon. members will refer, in the course of the debate, to any points in which they are specially interested, in which case I will endeavour to deal with those points later. For the moment I content myself with pointing to the high standard of performance of British machines as proof that the problems of research and technical development are being tackled earnestly, continuously, and on the whole successfully.

The Air Service is a young service; young not only in the years of its existence, but in the years also of the great majority of those who serve in it. It is likely that the last feature will always remain to characterise it. It is to be expected, therefore, that so long as the spirit of the Air Service is sound it will be a spirit of enthusiasm. Enthusiasm is a catching thing, and it would be unreasonable to expect that those of more mature years who are connected at all closely with this essentially young Service should altogether escape the spirit of enthusiasm which to-day pervades it, and I trust will always pervade it.

I do not remember an Air Estimates speech in this House, the tone of which has not been instinct with enthusiasm for the Air Service in all its branches, and particularly for the Royal Air Force. I do not expect mine to be regarded as an exception. I ask the House to believe that the closer one gets to the British Air Service, the more clearly one realises that it is indeed a proper subject for enthusiasm. I have claimed for the British Air Service that it has the best of machines, the best pilots, the most efficient ground organisation and the best technical skill and workmanship behind it. It is a large claim; but I believe it to be justified.

The Debate

MR. MORGAN JONES (Caerphilly, Lab.) said that aerial warfare must become more destructive and more ruinous, and its weapons were those of offence rather than of defence. Whole nations, and not only belligerent armies, would be involved. An expenditure of £1,000 upon land forces or naval forces would not produce an instrument nearly as deadly as an expenditure of that sum on aerial development. A reduction in expenditure on military flying was not a comforting thing, as the civil side could be adapted to warlike purposes. He pressed for some form of international control of civil aviation.

CAPT. KNATCHBULL (Ashford, C.), in a maiden speech, said that his feelings at the moment resembled those which he experienced on his first flight. He said that the expansion of an air force from a peace footing to a war footing took a fairly long time, and he asked if there were any means by which that time could be shortened. He dealt with the supply of aircraft and the supply of pilots. He asked the Government not to carry too far its policy of reducing the number of types of aeroplanes in each branch of the service, as the result of that policy might be to drive a large proportion of the aircraft industry out of business. To supply a pool of pilots, he pleaded that the aeroplane clubs should receive more support from the Government.

MR. MANDER deplored the destruction of R100. On the subject of air warfare, he said that if we were to have aggressive warfare in the future he hoped that it would be as horrible and brutal as possible, as then more people would sit up and say that they would not tolerate it. He hoped that we should do everything we could at Geneva to make triumphant the system of co-operative effort for which the war was fought.

MR. WHITESIDE (Leeds, C.), in a maiden speech, spoke as a pilot. He said that to suggest placing our civil aviation at the disposal of the League of Nations was as sensible as it would be to place our mercantile marine at the disposal of the League. He said that civil aviation was in a parlous state, and he pleaded the cause of the light aeroplane clubs. The subsidy to them should be granted, he suggested, not on a basis of licences obtained, but for hours flown. He also suggested, that instead of subsidizing giant air liners, we should get a greater yield on our money if we subsidized 9- or 10-seaters running every two hours to places like Hamburg, Berlin, Amsterdam, and Vienna. The service to India took twice as long as it need take with night flying. He urged the Under-Secretary for Air to approach the Postmaster-General so as to obtain more support from him for air mails.

MR. BATEY (Spennymoor, Lab.) thought that economies might have been effected in the pay of R.A.F. chaplains. He urged that provision should be made in this country for extracting oil and petrol from coal, so as to ensure a supply for the Air Force in case of war.

MR. A. HOPKINSON (Mossley, Ind.) spoke for the light aeroplane clubs. He said that he had been unable to accept his parliamentary salary of £400 p.a., but if the Government did not restore the subsidy to the clubs to a reasonable basis, he would draw his in future and hand it over to the club to which he belonged.

THE MARQUESS OF CLYDESDALE (Renfrew, C.) said that this country was appallingly weak as far as air defences were concerned, and he urged that 10 Auxiliary Air Force squadrons should be formed to complete the programme of 52 squadrons for home defence.

MR. MOORE-BRABAZON (Wallasey, C.) urged that the Government could help flying by encouraging the autogiro and things like the Diesel engine. He also pleaded for more help to be given to the science of meteorology.

MR. LOVAT-FRASER (Lichfield, Nat. Lab.) pleaded for a reduction in the noise which aeroplanes make, not inside the cabin so much as outside.

MR. SIMMONDS (Birmingham, Duddleston, C.), in a maiden speech, spoke of the danger of losing the skilled staffs of aircraft firms through lack of orders. He urged standardization of many parts, such as rudder bars, control columns, etc. He urged further experiments with re-fuelling in the air, and asked what was being done about lighting cable pylons at night. He wanted to see Imperial Airways employing better publicity methods. He also pleaded for support of the flying clubs. He urged the reduction of personal insurance rates for people who fly.

REAR-ADMIRAL M. SUTER (Hertford, C.) urged that something should be done to reduce the number of accidents in the Air Force. He pleaded for seaplane harbours at Malta and Gibraltar. He supported the suggestion for trying to reduce the noise of aeroplanes. He thought that the Royal Air Force should have a larger proportion of the total spent on defence.

MR. WELLWOOD JOHNSTON (Clackmannan, C.) moved an amendment "in the opinion of this House, it is desirable that His Majesty's Government should take all possible steps, by way of research, training of personnel, and maintenance of ground equipment, to facilitate the immediate resumption

of practical experiment in the development of rigid airships as soon as financial conditions permit." He said that he interested himself in this matter entirely on account of the possible civil use of airships for commercial purposes. He quoted remarks by the Prime Minister last May, and said that it was difficult to reconcile the present policy of the Government with those views.

MR. WELLS (Bedford, C.) seconded the amendment. He spoke of the "devastating" effect of the closing down of airship activities on his constituency. He stated that the only machine which had been successful in crossing the Atlantic was the airship, as even today we could not safely cross it in a heavier-than-air machine. We had learnt much from our recent experiments and we ought not to waste the knowledge.

LT.-COL. MOORE-BRABAZON thought that along the lines of greater and greater airships there was a possibility of success. But he doubted whether one could attract passengers to a hydrogen airship, and we could not afford the appalling expense of helium. He thought that the present policy of the Government was the right one for the time being.

SIR PHILIP SASSOON said that the whole situation was governed by the question of finance. Last August, the Government felt compelled to reverse their previous decision and to accept the recommendations of the May Committee. This decision had saved a sum of £120,000 in the Estimates. He was very much against those people who said that the R101 disaster was a reason for going back on former policy. The case for airships had been neither proved nor disproved. We had arranged to send one of our most experienced pilots to the United States to keep us informed of developments. Similar arrangements were being made with regard to Germany. The work of the Zeppelins in Germany and airships elsewhere had shown what they could do if properly developed. If properly developed, they held out a promise of inestimable benefit to mankind, and to no country more than the British Empire. But the Government were bound hand and foot by the financial situation.

The Amendment was negatived, and the main question was again proposed.

CAPT. H. BALFOUR (Thanet, C.) made a strong attack on the system of subsidizing Imperial Airways. That company, he said, had shown no consideration to Indian opinion, and so there was no route across India. He did not think that the African service was a very creditable service today. He said that the route had been opened before the machines suitable for it were ready, and he accused Imperial Airways of dilly-dallying before getting the route going. He asked the Under-Secretary for information about the Arabian route down the Persian Gulf. He said that there was greater inefficiency behind that monopoly subsidy than there would ever be behind a tariff. If Imperial Airways had never been born we should probably have had Post Office contracts for fast air mails, without worrying much about passenger traffic, but giving a maximum of efficiency in business communications.

BRIG.-GEN. SPEARS (Carlisle, C.) returned to his attack on the armoured cars of the Royal Air Force in Palestine and Transjordan. He accused the Air Ministry of lack of co-operation in dealing with the senior services.

MR. RHYS DAVIES (Westhoughton, Lab.), speaking as an old coal miner, believed that all aircraft must soon come under international authority.

SIR PHILIP SASSOON, replying to the debate, announced that "My noble friend has decided that the grants to these (light aeroplane) clubs, which under present arrangements terminate on July 31 of this year, shall continue after that date." He was not yet able to give any more details as the matter was only in the process of being concluded. A revised scheme would be introduced under which payments for new licences would be made on a more generous scale. It would be necessary to reduce the permissible annual maximum of £2,000 p.a. for any one club, though this had never been earned by any club. The new scheme would be of five years' duration. Replying to Capt. Balfour, he submitted that they were using State funds to the best advantage. During the last seven and a half years we had spent over £2,000,000 in subsidies to air transport. The United States had lost about double that sum during the latest complete year, so he did not see that we should benefit by copying their example.



At St. James's Palace

At the Levée held on March 15 by His Majesty the King at St. James's Palace, those present included Air Marshal Sir E. Ellington, Principal Air Aide-de-Camp; Air Vice-Marshal H. Dowding, and Group Capt. J. E. A. Baldwin, Aide-de-Camp in Waiting. Amongst those presented to the King were:—Lt. Col. Sir W. Acland, M.C., A.F.C.; Flt. Lt. A. Ashton, R.Can.A.F.; Flt. Lt. A. Atkins; Group Capt. J. Baldwin, D.S.O., O.B.E., A.D.C.; Flt. Lt. G. Beamish; Group Capt. R. Bone, C.B.E., D.S.O.; Flt. Lt. C. Brill; Sqd. Ldr. A. Briscoe; Flt. Lt. W. Brook; Flt. Lt. W. Cheshire; Flt. Lt. C. Chilton; Flt. Lt. R. Costa; Sqd. Ldr. E. Cuckney, D.S.C.; Sqd. Ldr. E. Dickson; Wing Com. F. Don; Wing Com. L. Forbes, M.C.; Flt. Lt. K. Guthrie, R.Can.A.F.; Air Vice-Marshal R. Clark-Hall, C.M.G., D.S.O.; Flt. Lt. J. Hargroves; Flt. Lt. S. Harris; Sqd. Ldr. F. Hebbert; Flt. Lt. J. Hutchinson; Flt. Lt. R. Jordan; F/O. H. Leech; Flt. Lt. H. Lester; Air Commodore R. Mills, C.B., M.C., A.F.C.; F/O. J. Mutch; Flt. Lt. G. Pack; Flt. Lt. L. Pankhurst; Flt. Lt. T. Prickman; F/O. G. Proctor; Sqd. Ldr. S. Quine, M.C.; Flt. Lt. L. Stokes; Wing Com. E. R. Vaisey, etc.

The African Airway

THE *Johannesburg Star* reports that on arrival at Capetown in the City of Baghdad, Air Vice-Marshal Sir Vyell Vyvyan stated that the first of the new Armstrong-Whitworth "Atalanta" monoplanes would probably be ready for service next October. The remaining seven machines would be delivered at fortnightly intervals. Sir Vyell said that the monoplanes might not be used right through Africa, but might replace only the "Argosies" on the Cairo-Khartoum section and the "Hercules" machines on the Kisumu-Capetown section. The "Cal-

cutta" flying-boats might be retained on the section Khartoum-Kisumu if it were found that in the rainy season the aerodromes were not suitable for the landing of land-planes. He declared that the aerodromes in Northern Rhodesia would have to be improved.

R.A.F. Aerodromes Overseas

In reply to a question in the House on March 3, the Under-Secretary for Air made the following statement:—Aerodromes at present occupied by the Royal Air Force are situated at Aboukir, Heliopolis, Helwan, Ismailia and Abu Sueir in Egypt (5); at Amman and Ramleh in Palestine (2); at Khartoum in the Sudan (1); at Mosul, Hinaidi and Shaibah in Iraq (3); at Karachi, Lahore, Ambala, Kohat, Risalpur, Quetta and Peshawar in India (7). Three of these—Heliopolis, Khartoum and Shaibah—are used by Imperial Airways. In addition the company uses an unoccupied Royal Air Force aerodrome at Baghdad West, in Iraq, an emergency landing ground at Semakh in Palestine, and landing grounds at Assiut, Luxor and Assuan in Egypt.

A Warning to Grand National Visitors

THE Automobile Association announces that the field situated east of Aintree Hall Farm, which has been used for the last two years by pilots bringing visitors to the Grand National, is now crossed by 50,000-volt power cables carried on pylons 60 ft. high. These cables render unsafe the use by aircraft of fields near and to the east of the racecourse. The A.A. recommends those visiting the Grand National by air to land at Speke, the Municipal Aerodrome of Liverpool. Although this aerodrome has not yet been fully equipped, a caretaker will be in attendance and information compiled by the A.A. will be available for the benefit of pilots requiring transport to Aintree.

The Industry

NEW CELLON LACQUERS

LACQUERS are now being made by Cellon, Ltd., at Kingston-on-Thames, from a synthetic base, a method which enables a very careful control to be kept over their composition. Durability obtained by this method is very much higher than that given by lacquers manufactured from ordinary gums, and, moreover, their resistance to the action of seawater is much higher, making them particularly suitable for seaplane work. They can be supplied in any colour and applied by either brush or spray, while the high gloss finish obtained by their use makes them admirable for aircraft work. A further advantage is the fact that their flash point is over 75 deg. Fahrenheit and they do not, therefore, fall under the Petroleum Act. Naturally the materials used comply with D.T.D. Specification 62.

OVERALLS

THE LONDON & PROVINCIAL AVIATION CO., of 10, Philpot Lane, London, E.C.3, are now supplying the popular white flying overalls. These are made from Horrockses material and have zip fasteners to the front opening and to the legs. Selfridge's Aviation Dept. are carrying a stock of these overalls and any other agents who are interested should apply to the above Company. A scheme which is of special interest to aerodrome authorities, joyriding operators and others whose mechanics come into contact with the public is one whereby the London & Provincial Aviation Co. will supply, wash, repair, and maintain the overalls used by the mechanics for an inclusive charge. If desired, these overalls can be supplied in distinctive colours and designs, thereby making a uniform.

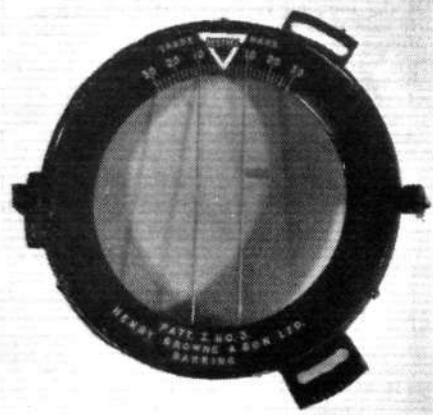
SPARTAN'S SUCCESS IN S.A.

THE following letter from Skywork, Ltd., has been received by Spartan Aircraft:—

"Technically, our tour has been a great success in that we have brought all three machines all the way round on a comprehensive tour of the Union of South Africa. The three machines have covered in all some 60,000 flying miles (about 220 hr. per machine) without top overhaul. They have flown in every conceivable type of weather condition, they have operated from extremely bad aerodromes, from heights between sea level and 6,500 ft. (the height of the aerodrome at Johannesburg), many stretches of bad country were flown at 15,000-16,000 ft. and the machines have frequently operated at a ground temperature of 110 deg. in the shade. Since they left the hangars at Cape Town they did not once go inside a hangar or workshop, and were always pegged out at night, many times in severe tropical storms. At all heights the performance of these machines has been amazing, and how deeply it has impressed the people of South Africa may be seen from Press cuttings. Local newspapers talk of nothing but the wonderful performance and endurance of the machines for weeks, and such national papers as the *Cape Times*, *Johannesburg Star* and the *Cape Argus* have been very generous and insistent in their praise of the aircraft."

A DRIFT SIGHT

NOT only those engaged in commercial flying, but also pilots who fly their own aircraft, will find the new Drift Sight marketed by Henry Browne & Son, Ltd., of Barking, of



The Henry Browne Drift Sight.
(Flight Photo.)

the greatest value. We have examined one of these instruments and find that it is well made in every respect. It is rigid and works easily, while the scale is lettered in bold white type, making it easy to read. At present it is intended that it should be mounted on the floor of the cockpit over a hole in a position which will allow the pilot very readily to ascertain his drift. The instrument itself takes the form of a rotatable verge ring much on the lines of that used for the ordinary compass; on the glass centre of this ring are two fairly widely spaced white lines which are so lined up by the pilot that the ground moves along them; the drift may then be read direct from the scale on the body. As an alternative, a bracket is being designed which will allow the instrument to be mounted on the side of the cockpit should the floor position be found impracticable.

HANGAR DOORS

AN ORDER for some 40 Kinnear Patent Steel Rolling Shutters for stores buildings at the Air Acceptance Park, Peterborough, has just been received by Arthur L. Gibson & Co., Ltd., Strawberry Vale, Twickenham. These shutters have already been described in *FLIGHT*, and years of use for this type of work has proved them to be easy to handle and in every way suitable for use in exposed positions.

BROWN BROS., LTD., DIVIDENDS

A FINAL dividend of $3\frac{3}{4}$ per cent. (less tax) on the $7\frac{1}{2}$ per cent. cumulative preference shares will be paid on April 1, 1932, making $7\frac{1}{2}$ per cent. (less tax) for the year 1931.

A final dividend of $7\frac{1}{2}$ per cent. (less tax) on the ordinary shares will be recommended by the Directors at the annual meeting to be held on March 21, 1932, which, with the $2\frac{1}{2}$ per cent. interim dividend already paid, makes 10 per cent. (less tax) for the year.

The transfer registers of the Company will be closed as follow:—

Ordinary share registers:—From March 16, 1932 to March 24, 1932, both dates inclusive.

Preference share registers:—From March 21, 1932, to March 31, 1932, both dates inclusive.



AN INDUSTRIAL TIGER MOTH. The Standard Telephone and Cable Co., Ltd., have just taken delivery of a new Tiger Moth (G-ABTB). The above group was taken when the aircraft was handed over at Stag Lane. (Left to right) Capt. Hursand, F. J. Brake (Technical Director), E. S. Byng (Managing Director), H. J. Herink (Chief Engineer), H. M. Samuelson (Pilot), S. T. Buer, and Capt. D. Sinclair. (Flight Photo.)

NEW WELLWORTHY SERVICE DEPOT

DURING last week, Wellworthy, Ltd., the piston ring people of Lymington, Hants, opened a new Midland Service Depot at Wellworthy House, Suffolk Street, Birmingham (Midland 0828). This depot will be run on similar lines to the London depot and a large and comprehensive stock of Wellworthy piston and scraper rings will be kept. Plant will also be installed to skim out worn piston ring grooves and fit the correct size of new rings.



R.A.F. UNIFORM

AMONG the new entry in the R.A.F. Short Service Commission scheme which has recently joined Uxbridge, there are sure to be many officers who have not yet acquired all the uniform they will want. When debating as to where they should go for this, they would be well advised to consider the claims of Gieves, Ltd., 21, Old Bond Street, who specialise in uniforms of every kind; moreover, their large connection enables them to equip officers in the most economical way.



VICKERS, LTD., DIVIDEND

THE DIRECTORS of Vickers, Ltd., declare, subject to sanction in general meeting, a dividend for the year 1931 at the rate of 5 per cent., less income tax at 5s. in the £ on the ordinary shares of the Company.

This dividend will be paid on Monday, April 4, 1932.



"SOLDO" TINNING COMPOUND

A REPORT by the National Physical Laboratory on the tinning compound marketed under the name of "Soldo" confirmed the claims made for its inter-penetration virtues, and its cleansing properties in the case of rusty and dirty metals. A test with manganese-bronze showed the extent of the inter-penetration to be four to five times, and with phosphor-bronze approximately twice as great as when an ordinary workshop method of tinning was employed. The cleansing properties were tested on severely rusted steel and cast iron, the result showing that the rust was removed and inter-penetration between tin and steel or iron obtained. This indicated that "Soldo" does not tin on top of the rust, or whatever the surface condition of the metal is; the dross rises after the metal has been heated (to just under red heat) and the "Soldo" powder sprinkled, and when it is wiped off with a cloth it leaves a pure coating of tin beneath. As the tin penetrates into the metal it forms an electrically and mechanically perfect bond, and it cannot be peeled off. The solderer will appreciate the pre-

liminary cleansing work of which "Soldo" relieves him. There is no scraping or pickling to be done, as when ordinary methods are used.

This compound is anti-corrosive, and is a combination of harmless-to-metal fluxes and metal in powder form. It can be applied to all ferrous and non-ferrous metals except aluminium and low-grade cast iron. Several metals that are usually difficult to tin, for example, chrome steel, blue planished steel and galvanised iron, will submit to this compound easily and effectively.

The Test Method

The N.A.T. tested it with phosphor-bronze, manganese-bronze, "Ohmal" strip, steel, cast iron and rusty steel. The method employed in using the compound consisted in heating the metal in a gas flame to a temperature judged sufficient, and on its removal the powder was sprinkled over the area to be tinned. The powder evolved fumes, appeared to melt, and rapidly produced a continuous tinned surface. One application was sufficient with the metals and surfaces excepting the rusty steel. This was successfully tinned after two or three applications of the compound, assisted by rubbing with a soldering iron. Rusty cast iron gave the same result after similar treatment.

The effectiveness of the tinning was judged by microscopic examination of sections through lap joints. These were made by tinning the two surfaces to be jointed in the one case with "Soldo," and in the other by dipping into molten tin under zinc chloride for 30-60 sec. The surfaces were then placed in contact and held together in a vice or by means of pliers. In the case of the joint made between phosphor-bronze and "Ohmal," after tinning with "Soldo," ordinary tinman's solder was applied before jointing. The operation of making a joint with the compound, stated the report, was at least as quick, if not quicker, than by the ordinary method. With steel the relative extents of inter-penetration using "Soldo" and an ordinary method respectively were shown to be approximately equal. In the case of manganese-bronze, as we have already said, the extent was four to five times and with phosphor-bronze approximately twice as great as obtained in the ordinary way.

Enquiries concerning this tinning compound should be sent to The Soldo Co., Sicilian House, Southampton Row, London, W.C.1.



THE PILOT'S CHOICE

AEROPLANE pilots, and particularly test pilots, are, as a class, seldom likely to be satisfied with lumbering 20-h.p. "pantehnicons" as their means of road transport. In the air they are used to thinking and acting rapidly, and, moreover, the machines they use in that medium are of the type which answer immediately, in a virile manner to all controls. It is not surprising, therefore, to find that within the last few months some

ten well-known aviators, including several test pilots, have chosen the new M.G. Magna for their ground transport.

The Magna is quite an exceptional car, as even a short road test will prove. It can be driven very fast if necessary, and readily attains over 70 m.p.h., but even in top gear it is very flexible and can be driven at a crawl when desired. The driving position is undoubtedly the most comfortable we have ever had the pleasure of trying. The gear lever lies right to hand and necessitates no bodily movement for its operation. The wheel is comfortably low, and does not obstruct the view forward at all. On the standard model the gear ratios are admirably arranged, and the veriest novice can change up or down through all four without the slightest trouble. A four-speed gear-box with the two top ratios fairly close is almost a necessity in a modern car, and in the Magna in particular it brings out all the finest attributes of the car, for the acceleration in third must be felt to be believed. One of its major charms lies in its handy size, for although the body accommodates four adults with ease, yet it is considerably smaller than most four-seater cars. We imagine the power rate ratio must be exceptionally good, as its engine develops over 70 h.p., although its capacity is only 1,250 c.c.

Mention must also be made of the really wonderful road holding and steering of the car. It is possible to take corners at the highest speed compatible with safety, and if the gear-box is used intelligently—as it is easy to do—the Magna is probably one of the safest cars to drive at speed that there is. It seems only natural, therefore, to find it selling so well amongst those who are used to flying. It is impossible not to be enthusiastic about the Magna once it has been tried, for it is the most satisfying car, from every point of view. The few criticisms which we had, particularly about the standard body work, are, we understand, already receiving the maker's attention.



BRANDED OILS

WHEN buying oil aviators and motorists should make sure that they get the brand they ask for. We are told that cases have occurred where unscrupulous dealers have sold cheap substitute oil under well-known proprietary names. This is fortunately very rare, as it is difficult, if not impossible, for the ordinary user to check.

But there is another danger which he can prevent and against which he should be on his guard. This is a form of piracy whereby grade letters established by national concerns through years of advertising are applied to quite unknown brands of oil.

There are oils branded "AA" or "XL," in imitation of the Castrol grade marks, and if a user desires to fill up with Castrol he should be careful to mention not only the grade letters, but also the make of oil, and to see that it is drawn from a cabinet marked with the makers' trademark.

AIR MINISTRY NOTICES

AIR MINISTRY NOTICES TO AIRMEN, SERIES A

No. 4 of the year 1932. Dangerous Flying over the Zoological Park at Whipsnade, Herts. (164572/32.)

In view of the fact that animals confined in the Zoological Park at Whipsnade, Herts., may, if unduly alarmed, charge and break down the fences of the paddocks, pilots having occasion to fly over the park should maintain a reasonably high altitude so as to reduce the possibility of disturbance to a minimum.

In this connection, the attention of pilots is directed to Article 9 (2) of the Air Navigation (Consolidation) Order, 1923.

February 24, 1932

No. 5 of the year 1932. (A) Flights Across the Strait of Dover : Arrangements for Reporting and Search. (47449/30.) (B) West London : Area of Restricted Flight. (16324/30.)

(A)
A signal of acknowledgment in the form of a white panel on a black background having been installed at Alprech semaphore station, Notice to Airmen, Series A, No. 6 of 1931, is amended as follows :—

Para. 1 (b) :—

Sub-section (ii) :—

Delete from the first sentence the words " (except, at present, at Alprech)."

Delete the N.B. at the end of sub-section.

Sub-section (v) :—

Delete the following words which commence at the foot of page 2, " [except at present, at Alprech. See para. 1 (b) (ii) as above]."

Cancellation.—Notice to Airmen, Series A, No. 69/1931 is hereby cancelled.

(B)

Cancellation.—Notice to Airmen, General Notice No. 23/1930, is hereby cancelled.

February 27, 1932

No. 6 of the year 1932. Amendment of Annex D of the Convention relating to the Regulation of Aerial Navigation. (75228/30.)

It has been decided by the International Commission for Air Navigation to modify Annex D of the international Air Convention including the Rules as to Lights and Signals and Rules for Air Traffic. The consequent modifications to the Air Navigation (Consolidation) Order, 1923, will be published in due course by means of an amendment to that Order.

One of the modifications concerns the lights which shall be carried by a seaplane or flying boat under 45 m. in span and in length, moored or at anchor on the water. The revised lights are as follows :—

" Forward centrally where it can best be seen a red light 1 m. vertically above a white light, both to be visible all round the horizon at a distance of at least 2 km."

These modifications will come into operation on May 7, 1932.

February 27, 1932

No. 7 of the year 1932. Re-marking of Compass Swinging Bases. (159140/32.)

The attention of proprietors of civil aerodromes is directed to the necessity for adjusting for change in variation, compass swinging bases which were laid down several years ago and have not since been corrected. Owing to the annual change in variation, which, in the case of England, is about 12' easterly,* bases which have not been adjusted since they were laid down 10 years ago will show a North Magnetic Point which is 2 deg. incorrect in position.

All such bases should, therefore, be checked and, if necessary, re-marked to allow for the change in variation. For future reference a clear indication should be made on the base to show the year in which the re-marking has taken place.

Care should be taken in the future that checks are made from time to time as necessary to ensure that these bases are kept accurately marked in accordance with changes in variation.

Owing to building developments (e.g., the erection of new hangars or the extension of electrical services) the existing position of compass bases may be quite unsuitable and re-siting may, therefore, be necessary.

In the case of all-metal aircraft, it is found necessary in a number of instances for the aircraft to be swung on 16 different headings, instead of the usual eight headings. In order to facilitate these operations, all bases should have the eight intermediate headings between the cardinal and quadrantal points marked in the appropriate positions (i.e., midway between N. and N.E., N.E. and E., etc.).

These points should be marked on the ground in the usual way, but need not have letters or figures to indicate their magnetic directions.

February 29, 1932

* I.e., decreasing.—Ed.

No. 8 of the year 1932. Landing of Aircraft on War Department Land. (156489/32.)

It has been brought to the notice of the Air Ministry by the War Office that a pilot landed recently at the Central Ordnance Depot, Didcot, without having previously obtained permission.

The attention of pilots is drawn to the fact that traffic in and out of War Department Establishments is subject to close surveillance and that aircraft must not land on War Department property without prior permission having been sought and obtained from the Under-Secretary of State, War Office, London, S.W.1. Applications should state the purpose of the flight.

In this connection, attention is directed to Article 33 of the Air Navigation, (Consolidation) Order, 1923, which prescribes that " Nothing in this Order shall be construed as conferring any right to land in any place as against the owner of the land or other persons interested therein, or as prejudicing the rights or remedies of any person in respect of any injury to persons or property caused by an aircraft."

February 29, 1932

No. 9 of the year 1932. Broadcasting of Weather Reports by the Automobile Association. (144825/31.)

The Automobile Association broadcasts daily from the A.A. W/T Station, Heston Airport, by radio telephony on 833 m., Air Ministry weather reports and forecasts at the times given below.

The reports are from stations grouped along five routes and covering two areas, as follows :—

Eastern Route to the North.

Bedford, Cranwell, Harrogate, Newcastle.

Western Route to the North.

Oxford, Birmingham, Coventry,† Chester, Holyhead, Liverpool, Renfrew, Southport.†

West Route.

Ross-on-Wye, Pembroke.

South-west Route.

Farnborough, Winchester, Southampton, Amesbury, Portland Bill.

South-east Route.

Croydon, Biggin Hill, Lympne, Dungeness.

East Anglia.

Felixstowe, Yarmouth.

London Area.

Heston, Stag Lane.

Minor amendments and additions may be made to the stations mentioned above from time to time.

The reports give the general state of the weather and the visibility at each station, followed by the amount and height of the base of low cloud and the direction and force of the wind, e.g. :—

Winchester. 0700. Partly cloudy; visibility three miles, 4/10 low cloud at 1,000 ft. Wind north-west, 5 m.p.h.

The forecasts are divided into appropriate areas covering England, Scotland, Wales and Northern Ireland, and give the probable form, character and intensity of precipitation, the anticipated changes in visibility, the direction and speed of the wind at the surface and at 2,000 ft., and the extent and height of low cloud that may be expected; e.g. :—

Eastern and Central England and eastern half of Northern England.—

No rain anticipated. Visibility, three miles generally, but 500 yards in places owing to local fog. Wind at surface: N.W. at 5 m.p.h. Wind at 2,000 ft.: 360 deg. at 15 m.p.h. Three-tenths to seven-tenths of low cloud at 1,200 ft.

The messages are read through once at normal speed and then repeated more slowly.

The hours of broadcasting are as follows :—

0845. 0700 hours observations along the five routes and in the two areas. 0930. Part I. Forecast for the period until noon.

Part II. Repetition of the 0845 broadcast amended by any subsequent reports received.

1030. Recent observations along the S.E. route and from supplementary stations elsewhere.

1130. Selected observations taken since 1000 hours along the five routes and in the two areas, with supplementary reports when available.

1230. Forecast for a period until dusk.

1430. Observations taken since 1300 hours along the five routes and in the two areas.

1530. Repetition of the 1430 broadcast amended by any subsequent reports.

1630. Forecast for the following day.

The Automobile Association announces that everything reasonably possible has been done to reduce the likelihood of errors to a minimum, but that the Association cannot accept responsibility for any inaccuracies which may occur.

February 29, 1932

† Coventry and Southport are supplementary, only one report per day being broadcast.

No. 10 of the year 1932. Oxford v. Cambridge Boat Race. (165302/32.)

The Oxford v. Cambridge Boat Race will be rowed on the River Thames between Putney and Mortlake on March 19, 1932.

Pilots of aircraft are requested not to fly in the vicinity of the course at a lower altitude than 2,000 ft. either when the race is about to start, or during its progress.

Aircraft engaged in flying in the vicinity of the course should carry out left-hand circuits until the conclusion of the race.

March 11, 1932

NOTICES TO GROUND ENGINEERS

No. 4 of the year 1932. Aircraft Fitted with Rotary Engines : Provision of Fireproof Bulkheads. (153352/31.)

With reference to Notices to Aircraft Owners and Ground Engineers Nos. 26 of the year 1929 and 19 of the year 1930, owners of aircraft with rotary engines who have not arranged for the modification of such aircraft by having a fireproof bulkhead fitted in accordance with the terms of Leaflet D.2 of the Airworthiness Handbook for Civil Aircraft, A.P. 1208, are further warned that the relaxation in regard to this requirement ceased to have effect after December 20, 1931, and that, consequently, certificates of airworthiness for such aircraft can no longer be renewed unless and until the modification in question has been carried out.

Full information with regard to the suitability of any proposed bulkhead can be obtained on application to the Airworthiness Department, Royal Aircraft Establishment, South Farnborough, Hants.

February 24, 1932

No. 5 of the year 1932. "Record" Electric Revolution Indicators : Maintenance Requirements. (158443/32.)

When the above-named type of instrument was approved for use on civil aircraft, it was anticipated that the generator commutators would not require periodic cleaning more frequently than once in every 100 flying hours. Certain early generators, the serial numbers of which are given below, were, however, fitted with silver commutators, the dust from which necessitates cleaning after every 50 hours' running.

Steps are being taken to replace these silver commutators with others made from a special alloy, but until this modification has been completed, regular observations of the generators concerned should be made, in order to ensure that they are cleaned after every 50 hours' running, or even more frequently if any sign of erratic behaviour of the indicating instruments is recorded.

The serial numbers of the generators fitted with silver commutators are as follows :—

1-63, 70-72, 74, 76-83, 97-100, 102, 123, 126, 127, 132, and 137.

For the purpose of cleaning the commutators, the seal must be broken and the bakelite cap unscrewed. The actual cleaning out of the commutator slots is best done by means of a tooth-brush. This operation must be carried out with extreme care, owing to the very delicate nature of the brush gear and electrical connections, and should preferably be carried out in a workshop.

February 27, 1932

No. 6 of the year 1932. Avro 504.N Aircraft with Lynx Mk. IV Engine : Air Intakes. (60361/30.)

With reference to paragraph 2 of Notice to Aircraft Owners and Ground Engineers No. 7 of 1927, air intakes to the following drawings are acceptable :—

O. 1258 introduced by Modification No. 504.N/8 (non-heated type).

O. 1495 introduced by Modification No. 504.N/57 (heated type).

Copies of the above drawings may be obtained from A. V. Roe & Co., Ltd., Newton Heath, Manchester.

March 10, 1932

THE ROYAL AIR FORCE

London Gazette, March 8, 1932.

General Duties Branch

P/O. on probation F. C. Daubney is confirmed in rank (February 19); P/O. E. C. Smith-Ross is promoted to rank of F/O. (January 12); Sqd. Ldr. P. F. Fullard, D.S.O., M.C., A.F.C., is restored to full pay from half-pay (March 1); F/O. A. J. P. Groom relinquishes his short service commn. on account of ill-health (March 9); P/O. on probation J. J. A. Ellison relinquishes his short service commn. on account of ill-health (February 17).

Stores Branch

The follg. F/Os. on probation are confirmed in rank:—G. J. E. Parsons (January 5); S. W. Thomas (January 27).

Accountant Branch

Flt.-Lt. W. E. Ennis is placed on retired list at his own request (February 23).

Medical Branch

The short service commns. of the follg. F/Os. are antedated to dates stated: C. R. Palfreyman, M.B., B.S. (December 1, 1930); F. W. P. Dixon, M.B., B.S. (January 20 1931).

Chaplains Branch

The Rev. F. D. Morley, B.D., is granted a permanent commn. (March 1).

ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The follg. P/Os. are promoted to rank of F/O.:—J. F. H. Bulman (February 6); C. B. McNair (February 6); J. M. D. Ker (February 12); D. B. Smith (March 1).

The follg. are transferred from Class A to Class C:—Flt.-Lt. H. S. R. Burt (July 12, 1931); Flt.-Lt. A. M. D. Howes (March 3); F/O. L. M. Timmins (January 19); F/O. L. C. Phillips (February 25). F/O. S. T. R. Hemsted is transferred from Class AA (ii) to Class C (February 26); Flt.-Lt. R. Y. Bush is transferred from Class C to Class A (January 27).

The follg. Flt.-Lts. relinquish their commns. on completion of service and are permitted to retain their rank:—H. Hemming, A.F.C. (June 4, 1931); E. H. Bryant (March 1). The follg. F/Os. relinquish their commns. on completion of service and are permitted to retain their rank:—C. K. Robinson (December 11, 1931); V. Vickers (February 26). The follg. F/Os. relinquish their commns. on completion of service:—C. R. S. Smith (December 13, 1931); C. F. Roupell (January 1); J. M. S. Taylor (February 26).

Medical Branch

Flt.-Lt. F. K. Wilson, M.B., relinquishes his commn. on completion of service (January 2).

SPECIAL RESERVE

General Duties Branch

H. S. Laws is granted a commn. as P/O. on probation (February 11).

AUXILIARY AIR FORCE

General Duties Branch

No. 600 (CITY OF LONDON) (BOMBER) SQUADRON.—F/O. R. Faulds is promoted to rank of Flt.-Lt. (January 24).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain: C. H. K. Edmonds, D.S.O., O.B.E., to Air Ministry (A.M.P.), 1.3.32; on appointment as Deputy Director of Manning, vice Group Capt. H. R. Nicholl, C.R.E.

Wing Commanders: G. H. Bowman, D.S.O., M.C., D.F.C., to No. 1 Armament Training Camp, Catfoss, 1.3.32; to Command. W. Sowrey, D.F.C., A.F.C., to No. 3 Armament Training Camp, Sutton Bridge, 1.3.32; to Command. S. R. Watkins, A.F.C., to No. 2 Armament Training Camp North Coates Fitties, 1.3.32; to Command.

Wing Commanders: G. W. Williamson, O.B.E., M.C., to Air Ministry (D.T.D.), 8.3.32, on appointment as Asst. Director (Instruments) vice W/Cdr. G. C. Bailey, D.S.O., L. L. MacLean, to No. 58 (B) Sqdn., Worthy Down, 29.2.32; to Command, with effect from 7.3.32, vice W/Cdr. E. R. Vaisey, E. R. Vaisey, to Home Aircraft Depot, Henlow, 7.3.32; for Engineer duties, vice W/Cdr. R. J. Mounsey, O.B.E.

Squadron Leaders: E. J. D. Townesend, to H.Q., Wessex Bombing Area, Andover, 23.2.32; for Engineer Staff duties, vice W/Cdr. G. W. Williamson, O.B.E., M.C., J. G. Walser, M.C., to Coast Defence Co-operation Flight, Eastchurch, 27.2.32; for Flying duties, vice Flt.-Lt. A. King-Lewis. T. F. Bullen, O.B.E., to Station H.Q., Upper Heyford, 22.2.32; for Engineer duties, vice Sqd. Ldr. E. J. D. Townesend. A. P. Maurice, D.F.C., to No. 22 Group H.Q., Grantham, 2.2.32; for Personnel Staff duties, vice Sqd. Ldr. G. G. A. Williams. C. L. King, M.C., D.F.C., to H.Q., Inland Area, Stanmore, 4.3.32; for Personnel Staff duties, vice Flt. Lt. R. W. Dawes. P. F. Fullard, D.S.O., M.C., A.F.C., to School of Army Co-opn., Old Sarum, 1.3.32; for Flying duties. A. P. Ledger, M.B.E., to Air Ministry (D.O.I.), 4.3.32; for Air Staff duties, vice Flt. Lt. A. MacGregor. S. L. G. Pope, D.F.C.,

A.F.C., to No. 54 (F) Sqdn., Hornchurch, 7.3.32; to Command, vice Sqdn. Ldr. W. E. G. Bryant. G. E. Ranson, to No. 21 Group H.Q., West Drayton, 1.3.32; for Air Staff duties, vice Sqdn. Ldr. C. W. Mackey.

Flight Lieutenants: H. E. Walker, M.C., D.F.C., to No. 216 (B.T.) Sqdn., Heliopolis, Egypt, 16.2.32. J. Blackford, to No. 2 (A.C.) Sqdn., Manston, 1.3.32. C. C. Edwards, to No. 40 (B) Sqdn., Upper Heyford, 18.2.32. R. G. Hart, M.C., to H.Q., R.A.F., India, New Delhi, 5.2.32. L. M. Elworthy, to No. 56 (F) Sqdn., North Weald, 3.3.32. A. King-Lewis, to Air Armament School, Eastchurch, 2.3.32. J. W. F. Merer, to No. 29 (F) Sqdn., North Weald, 1.3.32. C. B. Wincott, to Air Ministry (D.T.D.), 7.3.32.

Flying Officers: R. W. P. Collings, to Aircraft Depot, Lahore, India, 7.2.32. W. G. Stevenson, to No. 24 (Comms.) Sqdn., Northolt, 27.2.32. L. R. S. Freestone, to Air Armament School, Eastchurch, 29.2.32.

Pilot Officer J. W. Martin, to No. 39 (B) Squadron, Risalpur, India, 7.2.32.

Stores Branch

Squadron Leader E. H. Eldridge, to Air Ministry (D. of E.), 7.3.32; for Stores Staff duties, vice Flt. Lt. W. St. J. Littlewood.

Flight Lieutenants: E. G. Keeping, to H.Q., Cranwell, 7.3.32. W. St. J. Littlewood, to H.Q. Inland Area, Stanmore, 7.3.32.

Flying Officers: A. M. Reidy, to Air Ministry (D. of E.), 29.2.32. E. G. M. Charleson, to Station H.Q., Duxford, 29.2.32.

Accountants Branch

Squadron Leader: F. O. Hall, to Marine Aircraft Experimental Establt., Felixstowe, 2.3.32; for Accountant duties.

Medical Branch

Flight Lieutenants: C. G. Harold, to R.A.F. Depot, Uxbridge, 13.2.32; instead of as previously notified, 19.2.32. N. I. Smith, to R.A.F. Depot, Uxbridge, 3.3.32.

Transfer of Officers to the Reserve

THE undermentioned short-service officers become due during August and September next for transfer to the Reserve, or (where indicated) for relinquishment of commission, on completing their period of service on the active list:—

Flt. Lt. Philip Stearn Mumford; F/O's Alexander Cuninghame Pearson, Charles Henry Appleton, Leonard William Howard, John Cecil Kelly Rogers, James William Smith, Philip Holroyd Smith, James Collingwood Burdett Tinling, Alaister Le Roi Sabine Upton, John Bartholomew Veal, Arthur Donald Bennett, Dennis Murland Harrison, Noel Francis Victor Henkel, and *John St. Clair Arbuthnot.

* To relinquish commission. Not liable for Reserve service.

No. 18 (Bomber) Squadron

NO. 18 SQUADRON is being re-formed at Upper Heyford as No. 18 (Bomber) Squadron and is being equipped with "Harts." It is recalled in the *Army, Navy and Air Force Gazette* that this squadron was one of the first to use wireless telephony direct with Army headquarters while flying on reconnaissance. The double drum for Lewis guns was invented by members of the squadron armory in December, 1915. Capt. Norman, inventor of the *Norman compensating foresight*, used with much success on aerial Lewis guns, was a member of No. 18 Squadron. Its machines were particularly active during the German offensive of March, 1918, and in one day, March 25, dropped 6 tons of bombs. Maj. G. I. Carmichael, D.S.O., the original commanding officer, is now group captain in command of the station at which the revived squadron is located.

Attachment of Foreign Officers to R.A.F. Units

LIEUT.-COMMANDER SAX and Lieut. Pesatchitch, of the Yugo-Slav Air Service, has been attached to the following Units on the dates shown below:—January 19-February 7.—Central Flying School. February 8-20.—No. 1 School of Technical Training, Halton. February 22-29.—Royal Air Force, Cranwell. March 1.—Armament and Gunnery School, Eastchurch, for 5 months' Armament Course.

Sqd. Ldr. E. M. Bang, of the Swedish Air Force, was attached to No. 43 (Fighter) Squadron, Tangmere, for the months of February and March, 1932, in order to study the organisation of and work carried out by that Squadron.

The following attachments are notified:—As from March 1, 1932, to Air Armament School, Eastchurch, for Armament Course: Lt. Com. Criemadis, Greek Air Force (11 months); Lt. Com. Sax, Yugo-Slav Air Service (five months); Lt. Pesatchitch, Yugo-Slav Air Service (five months).

Capt. Hallegraef, Netherlands Indian Artillery, to No. 1 Stores Depot, 29.2.32 to 12.3.32, for short Stores Course.

Sqd. Ldr. E. M. Bang, Swedish Air Force, having completed his attachment to No. 43 (F) Squadron, Tangmere, on 20.2.32, proceeded to No. 17 (F) Squadron, Upavon, on 22.2.32 for attachment until 12.3.32. From March 14 to 19, 1932, he will be attached to Air Armament School, to study the organisation there.

45 Squadron R.A.F. Annual Reunion

NO. 45 SQUADRON R.A.F. War-time members will hold their sixth Annual Reunion on April 23 at 6.30 p.m. at the "Crown and Cushion" Restaurant, London Wall. This reunion is run by the non-commissioned officers and men who served with the No. 45 Squadron R.F.C., R.A.F. and B.E.F., and it is preceded by an afternoon meeting at 2.30 p.m. at Oxford Circus Tube station. All members of the squadron are invited to turn up at 2.30 p.m., and those who are unable to attend during the afternoon are reminded that the dinner meeting takes place at 6.30 p.m. All officers who served with the squadron are most cordially invited to attend the dinner—more so this year, since Capt. J. C. B. Firth, who was a whole-hearted supporter of the squadron's reunion, died on August 23, 1931. It is hoped that as many officers who served with the squadron as possible can attend, and all communications in connection with this reunion should be forwarded to: Mr. H. W. Grimmitt, 18, Leyland Road, Lee, S.E.12. Telephone: Lee Green 5270.

No. 2 F.T.S.

A DISTINGUISHED Pass has been awarded to P/O. R. J. Bennet on completion of a course of *ab initio* flying training at No. 2 Flying Training School, Digby.

The New President of the Institute of Metals

At the 24th Annual General Meeting of the Institute of Metals, the retiring President, Dr. Richard Seligman, inducted the incoming President, Sir Henry Fowler, K.B.E., LL.D., D.Sc., into the chair. Sir Henry Fowler was born in July, 1871, and served an apprenticeship at the locomotive works of the Lancashire and Yorkshire Railway at Ilorwich. In 1900 he joined the staff of the Midland Railway Company at Derby, becoming Chief Mechanical Engineer in 1910. In 1925 Sir Henry was appointed Chief Mechanical Engineer of the L.M.S. During the war, 1914-18, before the Ministry of Munitions was formed, Sir Henry was secretary to the Railway Companies' Munitions Sub-Committee, and when the Ministry of Munitions was formed in June, 1915, he was appointed Director of Production and later Superintendent of the Royal Aircraft Factory (as it then was) at Farnborough. He was also, as Superintendent of the Royal Aircraft Factory, a member of the Advisory Committee on Aeronautics, and was Chairman of the Light Alloys Sub-Committee of that body, as well as a number of committees dealing with various aircraft work.

Aerial Photography near Dublin

THE Minister for Industry and Commerce of the Irish Free State has declined to give permission for aerial photographs to be taken of the celebrations for the Eucharistic Congress to be held in Phoenix Park, Dublin, in June this year. It is understood that his decision has been based on the Air Navigation Regulations relating to flying low over populous areas, and a special order restricting all flying in the neighbourhood during the period of the Congress, June 22 to 26, is expected.

National Flying Services

THE Under-Secretary for Air stated in the House on March 7 that since the inception of National Flying Services, Ltd., grants to date amounted to £3,530, and that 235 pilots had been trained by the company. There had been six fatal flying accidents (including affiliated clubs), two during training, and four in the course of other flying.

A Change at Brown Bros.

MR. BERNARD R. BAUDS, who has controlled the Aircraft Department of Brown Bros., Ltd., Great Eastern Street, since its inception, has now resigned that position, and Mr. F. S. Wood, of the same department—so well known by all for so many years—has been appointed to the position as from March 1 last.

D. Napier & Son, Ltd., Annual Report

THE Directors of D. Napier & Son, Ltd., announce that their Annual Report which will be issued shortly will show (subject to audit) that the net profits for the year ended September 30, 1931, amounted to £21,562 6s. 9d., after making reserve for depreciation of £81,179 1s. 2d. in respect of the values of the Company's investments in British Government securities as at that date. The Directors cannot recommend the payment of a dividend on the ordinary shares for that year.

3rd T.M.A.C. Dance

ARRANGEMENTS have been made for the above dance to be held at Suffolk Galleries, Suffolk Street, Pall Mall, on Saturday, April 16, from 7 o'clock to 12 o'clock. Tickets 2s. 6d. each, which may be obtained from Mr. C. F. Buckland, 57, White Friars Drive, Harrow; Mr. E. A. Burt, 20, Stirling Buildings, York Street, Strand, and Mr. F. A. Whippley, 18, Crestwell Road, Twickenham. Will those members and friends who are interested in the social side of T.M.A.C. please make early application for their tickets as numbers are limited.

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IMPORTS AND EXPORTS

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1930 being given in FLIGHT, January 16, 1931.

	Imports.		Exports.		Re-exports.	
	1931.	1932.	1931.	1932.	1931.	1932.
Jan. ...	7,965	2,456	142,596	122,942	1,074	863
Feb. ...	3,303	2,503	110,587	181,482	1,293	90
	11,268	4,959	253,183	304,424	2,367	953

PUBLICATIONS RECEIVED

Aeronautical Research Committee Reports and Memoranda: No. 1,419 (Ae. 540-S. & C. 389), *Tests on Model of "Wapiti," including Effect of Slipstream*. By A. S. Hartshorn, D. M. Hirst and G. F. Midwood. March, 1931. Price 1s. net. No. 1,420 (Ae. 541-T. 3,124), *Wind Tunnel Data on the Balancing of Controls*. By F. B. Bradfield. May, 1931. Price 1s. 3d. net. No. 1,423 (Ae. 544-T. 3,128), *Some Features of the Earlier Pterodactyl Design*. By S. B. Gates and D. M. Hirst. June, 1931. Price 9d. net. London: H.M. Stationery Office, W.C.2.

Compression Ignition Engines for Road Vehicles. By the Editor of "The Commercial Motor." London: Temple Press, Ltd. Price 2s. 6d. net.

Who's Who in British Aviation, 1932. Edited by T. Stanhope Sprigg and A. J. Thompson. London: Airways Publications, Ltd. Price 6s. net.

The Modern Diesel: A Review of High-Speed Compression Ignition Engines. London: Iliffe & Sons, Ltd. Price 2s. 6d. net.

Return of Civil Aircraft and Air Transport Companies in Europe, March 31, 1931. Directorate of Civil Aviation, Air Ministry, Gwydyr House, Whitehall, S.W.1.

Il Libro del Pilota Aviatore. By F. Barbieri. Milan: Ulrico Hoepli. Price L.38.

Estimating for Mechanical Engineers. By L. E. Bunnett. London: Sir Isaac Pitman & Sons, Ltd. Price 10s. 6d. net.

Calendar, 1932. The Blackburn Aeroplane & Motor Co., Ltd., Amberley House, Norfolk Street, Strand, W.C.2.

Luftkrieg, 1936: Die Zertrümmerung von Paris. By Major Holders. Berlin: Wilhelm Rolf. Price 3 M. 80.

La Stabilité et la Direction Automatiques des Avions. By L. Marmonier. L. Marmonier, 146, Avenue Felix-Faure, Lyon, France.

Avion-Helicoptère à Helices Orientables. By L. Marmonier. L. Marmonier, 146, Avenue Felix-Faure, Lyon, France.

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NEW COMPANY REGISTERED

PHILLIPS & POWIS AIRCRAFT (READING), LTD. INCREASES OF CAPITAL.—The nominal capital has been increased by the addition of £2,000 beyond the registered capital of £5,000. The additional capital is divided into 500 preference and 1,500 ordinary shares of £1 each, ranking *pari passu* with existing shares.

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AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. (The numbers in brackets are those under which the Specification will be printed and abridged, etc.).

APPLIED FOR IN 1930

Published March 17, 1932

- 24,595. MODERNE PRECISION. Sights for anti-aircraft guns. (367,402.)
 27,546. VICKERS-ARMSTRONGS, LTD., C. A. LARSSON and P. R. HIGSON. Mountings for machine guns carried by aircraft. (367,367.)
 34,698. GAS ACCUMULATOR CO. (UNITED KINGDOM), LTD. Wind indicators. (367,423.)
 39,204. L. STEIN. Aeroplane wings. (376,506.)

APPLIED FOR IN 1931

Published March 17, 1932

- 1,741. G. TRICAU. Parachutes. (367,522.)
 1,933. F. M. DAINTON. I.c. engines having radial cycls. (367,526.)
 7,368. A. F. THOMPSON. Heater for aeroplane wings. (367,584.)
 20,796. LUFTSCHIFFBAU ZEPPELIN GES. Lighter-than-air aircraft. (367,707.)

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